The Builder.

VOL. XXXVII. No. 1904. SATURDAY, DECEMBER 20, 1879.

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Colour in Architecture: Wall Decoration.

COLOUR is a subject that is just now attracting an unusual amount of attention. It is one on which our own pages have contained much that may, we hope, be remembered or referred to with advantage. The October number of the *Edinburgh Review* contains an article on the subject of the perception of colour, which is singularly clear in its philosophic statement of the rudiments of the study, and especially demands the attention of the architect, as showing the different, and indeed opposite, action of pigment colours and of tinted light, when mingled in order to form a compound tint. And the December number of *Macmillan's Magazine* contains a paper of an unusually wide range of reading, and command of physiological as well as of literary knowledge, bearing on the discussion of the question whether the colour-sense in man has varied in intensity within historic time; such variation, be it understood, having been suggested to have occurred in the way of increase in the power of perception.

In these articles, as well as in some from a writer well acquainted with the use of colour, which have appeared in our own columns, two sides of the question of colour have been mainly discussed. These are, of course, the artistic and the scientific sides. They regard colour from the point of view of the painter, and from that of the physicist. We wish to call attention to what is a more limited, possibly a more humble view of the subject, but one which possesses no small interest for us all,—that is to say, the architectural point of view. We spoke the other day of colour in the exterior of the building; we intimated, in that article, that we had a few words more to say on the subject of colour in the interior.

We feel, however, that we are as yet so far from having arrived at the discovery of any definite *régime* of laws which should regulate this very important part of the practice of the architect, that it will be of more use to indicate the various directions in which inquiry should be made, and thus to seek for facts and for suggestions from our readers, than it would be, at the present moment, to attempt to lay down the A B C of the architectural treatment of interior colouring.

Colour, when given to the interior of buildings, has been hitherto mainly regarded as a means of ornamentation or decoration. As such, its use has been of a twofold nature; that is to say, coloured light has been either transmitted or reflected. This, of course, is no new remark, although it may be desirable to recall the fact. Transmitted colour is given by means of stained glass. Reflected colour, which is most pure when thrown on the eye from rich marbles and coloured stones, is also produced by painting, by gilding, by the presence of pictures which are not drawn on the walls of the building, but merely hung before them, by draperies, by coloured work, and by wall-papers. In all these cases, if we except the polished stone, the colour is produced by pigments, as distinct from the admission of coloured light. Polished stone acts, it may be considered, in a mode intermediate between that of the window and that of the painted wall. The material being natural, its action on light cannot be said to be exactly the same as that of an artificial pigment. On the other hand, its action on light is by reflection, and not by transmission; if we except the rare cases where alabaster or translucent stones are employed actually to transmit a softened light, as in some of the luxurious palaces of the East.

This distinction between a transmitted and a reflected colour is not one of theory alone. It is one that is most important to be borne in mind by the architect who seeks to attain as perfect a mastery over the use of colour as he desires to exercise over the use of form. The experiments of Professor Clerk Maxwell have gone far to destroy the old arrangement, which speaks of red, blue, and yellow as the normal primary colours. Most of the investigations conducted upon pigments tend to that classification, which in all works written on the subject, down to within a short time, has been taken as indisputable. It is the action of transmitted light which has been indicated by Professor Maxwell's experiments to be inconsistent with this view. Red, green, and violet are, according to this view of the subject, when the spectrum is regarded, found to present the quality of elementary light; while yellow shows all the signs of a compound. If pure red, pure green, or pure violet light is thrown upon the prism, it passes through it undecomposed. It comes out of the same hue that it goes in. But when yellow light is thrown upon the prism, red and green rays emerge from the opposite side. It follows that the red, green, and violet vibrations, or that particular action or movement which excites those sensations in the human sensorium, are homogeneous, and that the vibrations, or action which excites the sensation of yellow, are not homogeneous.

We do not write as either accepting or combating this view; we only state it.

Hence arises a new theory of the use of pigments. It is to this effect. The mixture of blue and yellow pigments produces the effect of green on the eye. The reason is, that the blue pigment absorbs and extinguishes all the yellow, orange, and red light, while the yellow pigment absorbs and extinguishes all the violet, indigo, and blue light. Only the green rays remain unabsorbed, and are reflected to the eye. It is obvious that such a view as the above must have a controlling effect on the disposition of light within a building, inasmuch as it regards not only tint, but quantity. This will be seen in a moment from a little table of the relative value of the colour constituents of white light, according to the calculations of Professor Rood. The various colours of the spectrum are divided by this analyst into twelve groups, with pure red and pure violet as the two extreme poles. Taking white light as equal to 1,000, the proportions of the colours are given as follow:—

Tint.	Parts.	Tint.	Parts.
Red	54	Green and Blue Green	134
Orange Red	140	Cyan Blue	33
Orange	80	Blue	49
Orange Yellow	114	Ultra-marine and Blue Violet	29
Yellow	54	Violet	5
Greenish Yellow	206		
Yellowish Green	121		

It will be seen from the above table, that all the rays of the spectrum which contain green light amounts to only $\frac{461}{1000}$ parts of the whole. And as red extends over $\frac{443}{1000}$ parts, and violet and blue over $\frac{87}{1000}$ parts, while the influence of these tints may be said to meet in the "green and blue green" band or portion of the spectrum, the exclusively green rays must be appreciably less than $\frac{461}{1000}$ of the whole pencil of light. It follows, if these new views be correct, that if an architect who admits to an apartment a volume of light which he considers adequate for the purposes of illumination, colours his walls green, he has, as far as reflected light goes, only some 40 per cent. of that on which he might calculate.

Again, we may hence understand the cause of the grave and tranquillising effect of the dull red colouring of which the decorative artists among the Romans made such frequent use for interiors; as we may observe at Pompeii, and in many parts of Italy at the present day. In a climate where the light and heat of the sun are, for a portion of the year, so much more intense than is often the case in more northern latitudes, it might have been thought that red was a particularly inappropriate colour for the interior of a house, a palace, or a temple. We should have anticipated that the effect on the eye would have been that of glare, and thus of intensifying heat; while, on the contrary, a pure white wall would give a cool imitation of the light reflected from snow-covered mountains, or from plains bound in ice. But in point of fact, this particular tone of red was a great favourite in Imperial times, and has to a certain extent held its own in Italy to the present time. Nor was it absent from the Egyptian decorations in the great times of Egyptian art. How are we to account for this? It is clear that neither the Italian nor the Egyptian architects could have had any philosophic conception of what colour in its essence was, being destitute of all such advance towards the solution of that problem as has been due to the invention of the prism by Sir Isaac Newton, as an instrument of analysis. At the same time, there is every reason to hold that the classic artists, and probably their Egyptian forerunners, made a far more systematic and exhaustive study of what was luxurious in the appliances of life, as well as of what was becoming to personal beauty, than any one now dreams of doing. And we may

take it as tolerably certain that if red walls had produced a sense of glare or of extra heat in hot weather, that fact would have been discovered by the classic artist, and red walls would, in consequence, have been avoided. But when we see that pure red forms only $\frac{1}{1000}$ parts of the spectrum, and that enough red to give the effect of orange to a mixture with green only extends to $\frac{144}{1000}$, we become aware that the Pompeian decorators had, however unconsciously, found the means of absorbing and extinguishing more than 80 per cent. of the light which would have been reflected from a white wall. Dimly this must have been felt rather than perceived. The value of the analysis of Professor Rood in enabling us thus to give a numeric expression to the amount of loss of light is capital.

Here, then, we venture to suggest, will be indicated the first rule which has to be framed as to the colour of interiors. What will be the amount of light which, having been allowed to enter an apartment, it is desired to preserve by reflection or to extinguish by absorption? Given a certain amount of transmitted light, the above table will enable the artist to arrive at the amount of preserved or reflected light. Nor is the question one of little moment. We saw some time ago how much the German architects were in advance of ourselves in that question of school illumination which was introduced in our columns. America now sends us a fresh contribution to our knowledge of interior-lighting, where the amount of light admitted has in the first instance been decided.

Connected with this question of how to deal with the light admitted into a room, is the inquiry into the texture, as well as the colour, of the material that lines the walls of an apartment. The remark made as to the effect of red, in Italy, may lead to the further consideration, that the best diffused light will be that reflected from a *mat* surface, or from a soft, unpolished white. From a surface of pure white polished marble, or from a surface of burnished silver, light is reflected with a sharpness which is distressing to the eye. A pearly grey tint is far more agreeable, because, by absorbing a certain portion of the rays, it reflects a less vivid light. But we may suggest that a better effect is likely to be produced by entangling the rays of light in their course, bending them one on another, and sending them back to the eye in a broken flight, instead of in a full volley, rather than by *dirtying* the light to check its intensity. And we must call the use of grey shading by that term, inasmuch as it intersperses lines of no light between the pencils of light. The singular beauty of such substances as alabaster, and the transparent white porcelain on which such exquisite transparencies in relief are modelled, chiefly by German artists, confirms this view of the case. Even with regard to marble, there can be no comparison between the beauty of such a surface as the sculptor leaves on the flesh of a statue, and that of the high polish given by the stonecutter. The same is the case with regard to ivory. Nothing is more easy than to give a brilliant polish to ivory. A little chalk and water applied by a brush are all that is required for the purpose. All workers in ivory, except those few who happen also to be artists, are free in their use of polish. Hence, no doubt, the sense of poverty and vulgarity which so often and so unavoidably is caused by the display of common or other works in ivory. Some would say that the difference between the chalk-polished surface, and that finished by the burin of the artist, was the difference between the mechanical and the artistic; that the first disgusts the taste, the other attracts it. May be that is so; t whether it is or not, the difference between he dazzling reflection of the white incident light in a mass, and the broken and tender softness of the same light when it has for a time lost its way in following the movement of the tool of the artist, is enough to account for the effect. What would be the claim of the Venus of Melos if she were polished until she shone like a pair of well-blacked boots? On the other hand, the most beautiful copy of the Venus dei Medici with whom we are acquainted is one which stands (or did so *consule Planco*) in the vestibule of The Grove, Lord Clarendon's seat in Hertfordshire. The figure is of bronze, and although the colour is not to be compared to that of marble, the effect of the *mat* surface is such as to make the statue incomparably more beautiful than any plaster cast. Yet if a plaster cast were roughened, as by covering it with glue or gelatine, and then dusting it with chalk, we apprehend that (until the surface grew dirty) we should have a very beautiful statue.

These two questions of the quantity of light reflected, and of the broken and mingled manner in which white (or tinted) light is reflected from interior surfaces, are, we venture to think, as well deserving the attention of the architect as they are, up to the present time, new and undiscussed. Another remark follows naturally from the preceding calculations, and that is, that we have an explanation thus afforded of the much greater richness of effect that is produced by tapestry, or indeed by drapery in general, than by wall paper. In the textile fabric there may, or may not, be a blending of colours that is in itself beautiful. In the faded ancient tapestries, to which we can now only look in order to form some idea of the domestic elegance of the stately rooms of our ancestors some three or four centuries ago, the charm of colour has, for the most part, fled. And yet what is the effect on the observer? Not, we apprehend, that of association alone. It is felt by those who are quite innocent of any archæological tastes. The entanglement of the light in the textile surface is such as to send it back diffusedly to the eye. And the eye, untaught by any science but that of its maker, appreciates the charm.

So again with silks, velvets, rich hangings of any kind. Compare the plushy surface of a piece of velvet,—black or white,—with the satiny sheen of a poor silk, dressed with that shiny, glossy, surface which was once admired. We do not speak of the sheen of satin, because satin has really a *mat* surface, though there is a gloss owing to the fineness of the texture. But what we mean will be seen in comparing a rich and a poor satin. In fact, the coining of the word "shiny" expresses the sense unconsciously entertained, that there is a difference between gloss and richness,—between that which is shining and lustrous, and that which is shiny or glazed.

Again, we may look at wall-papers. Those rich, dark, crimson, or morone papers, with a flock surface, at times relieved with gold, which some decades ago were in favour, have to a great extent disappeared from our dining-rooms. The reason, as far as any reason can be assigned for the vagaries of fashion, is said to be the darkness of these papers. For this our previous remarks fully account. The red colour extinguishes some 80 per cent. of the light thrown upon it. And the red light actually reflected is so broken and diffused by the *mat* nature of the surface, that its effect on the eye is wholly different from that which would be produced by a paper of exactly the same tint with a glazed or hot-pressed surface.

The same explanation accounts for the fact that no wall-paper has been as yet produced which can in any way give the effect of damask panelling. The difference of cost, of course, is enormous. But any one who compares the effect of a room panelled with a rich silk, with that of one similarly decorated with a paper of exactly the same colour, and on which the same arabesques are produced, will see at once that there is no deception in the matter. For those who are rich enough to afford the former, the cost is, as matter of internal decoration, money thoroughly well laid out. But we do not apprehend that this cost need be always incurred. The reason is, at present, that the paper-manufacturer has not had his attention directed to the true cause of the rich effect of the silk. He has produced tints and damask patterns which are fully equal, and often much superior, to those of the textile workmen. But he has not imitated the surface texture of the woven fabric. When he has deadened the surface of his paper by flock, he has provided a universal dust-trap, and has overdone the effect of breaking up the reflected light. What remains is for the paper-maker to make experiments as to surface. For example, an expensive kind of writing-paper has been lately made, the surface of which is covered with fine corrugations. As far as we have had experience, the only objection to this paper is its cost. It affords a very good resistance to the pen, and gives a fine *mat* effect to the eye. We should like to see the same process experimentally applied to wall-papers. It is possible that it might not succeed. We can offer no opinion without a trial. But, on the other hand, it is possible that it may succeed. And, if parallel lines prove objectionable, other methods are available to the paper manufacturer by which he may give to the surface of his paper the effect of the texture of a woven surface. As soon as this is attained, we have little doubt that paper panelling will be made as effective as silk panelling, and of course at a very much lower cost.

The study, of which we are thus venturing to indicate the rudiments, is as important for the industrial artist as it is for the architect. It is not too much to say that it is impossible at the present moment to foretell the exact effect of any design in colour when applied to an interior. From mosaic or water-glass painting on a church wall, to the wall-paper of an apartment, trial is requisite. Of course, when a given effect has been noted in a particular locality, experience is obtained; but it is locked up in the breast of the architect or of the designer, and is not available for general guidance. A striking instance of this came within our own knowledge the other day. A lady who possesses that instinctive taste in colour which is more common among French, than among English, ladies, spent some time in looking over an assortment of new patterns of wall-paper, with a view to make a choice for a room. Very beautiful some of these papers certainly were,—artistic in design, harmoniously blended in colour, and generally reproduced in two or three different tints, so as to give a wide range of choice. Of these she selected one which pleased her the most,—a very beautiful paper it was, of small flowing pattern, and delicate olive, russet, and pink tints. Every one approved the choice. But it so happened that before anything else was done, a large folding screen was covered with this paper. The effect was most disappointing. Looked at as a design, the paper had been faultless. Its effect in reflecting light in the room was decidedly bad. What looked so delicate in the outspread sheet, looked dusky, poor, and even mean, on the vertical screen. A room would have been ruined by the application of the paper,—that is to say, if the effect had been compared with that produced by many a far less carefully prepared and chosen material.

If the same skill and taste which had been devoted to the production of the beautiful but inappropriate design had been enlightened by an acquaintance with those laws of internal colouring for the determination of which we have endeavoured to begin to clear the ground, we cannot doubt that the result would have been, not a success in draughtsmanship, but a success in decorative architecture. With a little more exact knowledge of the laws of reflected light we shall find some of the most angry architectural controversies of the present day shrink to very modest proportions. Our great aim is always to transpose a question from the condition in which a man says,—"My taste is as much worth respect as yours," to that in which he says,—"Such are the scientific facts of the case, can there be much dispute as to their application?"

ROYAL ACADEMY.

LECTURES ON ARCHITECTURE.

Professor E. M. Barry, R.A., will deliver his annual course of six lectures at the Royal Academy, on Thursday, January 8th, and the five following Thursdays. We have much pleasure in stating, as we did last year, that the authorities of the Royal Academy are willing to admit students of other societies, or from private offices, and also persons interested in the subject, to attend the lectures as far as space (which is primarily devoted to their own students) may permit.

Applications for tickets are to be made to the Professor of Architecture at the Royal Academy, Burlington House, W., or at No. 21, Abingdon-street, S.W.

The subjects and dates of the lectures are as follows:—

Jan. 8.—Architecture in theory: a matter of public interest.
Jan. 15.—Architecture a fine art, and also an art of utility.
Jan. 22.—Architecture governed by technical principles.
Jan. 29.—Architectural ornament.
Feb. 5.—Architecture allied with colour.
Feb. 12.—Architecture in practice, under the conditions of modern life.

For the vacant Post of Surveyor to the Orphan Working School buildings and estates there were nearly 100 candidates, from which three were chosen for a final selection, viz.,—Messrs. Charles Bell, Gwyther, and S. Hill, and at a meeting of the committee on Wednesday, the 10th inst., Mr. Bell was elected.

FREDERICK PEPYS COCKERELL.*

IN the cemetery of Auteuil, near Paris, on a sad November day, was laid to rest all that was mortal of one who has left specially to the Guild of British Architects the legacy of a most honoured name. An allusion in the Presidential address of last session, to a loss then so recently sustained, touched the heartfelt sympathies of the audience by an appeal to the mute eloquence of an empty chair. With what grace the functions of honorary secretary were discharged by Frederick Pepys Cockerell is unanimously acknowledged no less by those whom he represented than by the artists of foreign nationality whose interest he was successful in associating with our own English aims ond work. His skill as a linguist in the expression of his own genial and appreciative mind made him a true exponent of those fraternal sentiments by which British architects are assuredly actuated towards their foreign friends and colleagues.

When summoned from a life bright in social and professional success, rich in the promise of future distinction, he was on a visit in Paris, spending his days in the Exhibition Buildings, and a welcome guest at the tables of distinguished professional colleagues. On the 4th of November, 1878, friends assembled to do him honour at the house of M. Duc,—whose own decease occurred only a few months afterwards,—were shocked to learn that their last words with him had been an unknown farewell. Death had been immediate upon a sudden seizure that day. At his grave side a tribute of respectful sorrow from those Frenchmen whose work he had ever warmly appreciated, and whose intercourse had brightened the closing hours of his life, was feelingly paid. M. Hardy (Architecte de l'Exposition Universelle), M. Vaudremer (Architecte de la Ville), M. Pellechet,—all three comrades of his youthful travel and study,—and MM. Duc and Lefuel, were there; as well as M. Daumet, whose beautiful drawings for the Duke d'Aumale's château at Chantilly had been the theme of admiration in the very last letter which was gladdening home, when the dark message came that its writer could never return.

A desire having been expressed that a biographical sketch of the late Honorary Secretary should take its place among the records and papers of the Institute, it is well that the task should be performed while its difficulty can be appreciated, and the deficiencies of the portraiture inseparable from its subject can be supplied by the loving recollection of his professional contemporaries. No succession of great public works executed by him arrests attention, compelling admiration or challenging criticism; yet, who is there among the most distinguished in architecture who does not feel the loss which was sustained in his death? As an artist he will be remembered,—as a man of delicate taste and fine perception, of generous impulse, and catholic liberality, which, harmonising the intellectual with high moral qualities, formed a character of rare attractiveness not easily conveyed to the minds of any who were strangers to its refining influence.

Frederick Pepys Cockerell, born in 1833, was the second surviving son of Charles Robert Cockerell, R.A., and Anna Maria his wife, daughter of the engineer, John Rennie. At that time no name was more illustrious than his father's in the society which awards honour to artistic genius. Some sentiment of romance, moreover, affected the minds of many friends towards the man who for years of early youth, though gifted with every grace of presence and every social charm which could fit him to shine in cities, had devoted himself with a rare singleness and courage of ambition to the exploration and study of buried sculptures and gems of architecture cruelly maltreated,—reckless of the peril which in those days beset the traveller in continental Greece, and still more him who committed himself to the yet ruder life of her island population. Shortly after he was appointed to the Professorship of Architecture in the Royal Academy, his interest in the reputed works of William of Wykeham led the elder Cockerell frequently to visit Winchester College, and there he placed his son Frederick as a commoner in the year 1845. Winchester was at that time a very rough school. The authorised despotism of the sixth form, and too much unauthorised self-assertion of the stronger over the weaker, formed, however, a discipline not wholly disadvantageous to such of the new comers as were gifted with courage and temper. Old Wykehamists of his own standing, and many who at his coming were high in the school, remember Cockerell a bright-faced curly-headed boy, who, while never subjecting himself to the severe punishment which awaited rebels against constituted authority, always managed by intuitive tact and good humour to disarm the terrors of the bully. Sufficient that he won his way rapidly to popularity and the full enjoyment of a school life to which he always looked back with pleasure and affection. Already, in so early boyhood, his father seems to have discerned and appreciated in him some germs of an æsthetic tendency. A little entry in Mr. Cockerell's diary during his son's first holidays is touching when read in the light of after-events:—"June 28, 1845. With my boys to the Academy Exhibition; judgment and taste in Fred.; more combativeness in Robert." The one was to be our artist friend; the other, who set his heart upon a soldier's career, fell gallantly in his twentieth year as a lieutenant in the Royal Artillery at the memorable battle of the Alma.

Meanwhile the Winchester curriculum of that date gave no encouragement to the acquirement even of the rudiments of art and science. There, proficiency in the mechanism of Latin verse was the special avenue to distinction, and it does not appear that in this young Cockerell achieved any marked success. The bent of his disposition was rather shown in the collection of little drawings, fruits of feeble tuition, which he treasured as memorials of the school friends whose names they bore. At the close of 1848 he matriculated at King's College, London, and the reason for this so early change in his course of studies may probably be found in the name of the department to which he was attached, viz., "Applied Science," with all the branches of which his father, clearly destining him to the profession of architecture, desired that he should now begin to be conversant. For about five or six terms he is recorded in the College books as constantly attending the lectures, during which time his fellow-students were more impressed by his presence, vivacity, and cleverness of conversation, than by any apparent devotion to severe study. One who sat next to him at Professor O'Brien's Lectures on natural philosophy remembers Cockerell's note-book as being fuller of deftly-traced towers, pinnacles, and spires than of the teaching which its pages were intended to record. He was observed to affect much the companionship of the medical students, with whom as an "occasional" he attended the anatomy classes. Familiar, doubtless, with a favourite theory of Professor Cockerell that the human frame is the basis of all idea of beauty, he set himself with interest to a study which must always be the foundation of correctness in figure-drawing. It bore fruit in the facility which he afterwards enjoyed of thorough truthfulness in the expression of an instinctively delicate sense of form. In designing decorations he would outline a figure, 2 ft. high from head to foot, and up the other side, without taking his pencil from the paper. This dexterity was no less edifying to those who witnessed his office work than amusing in general society, when, to illustrate some point in conversation, or to describe a scene, a minute or two with a pocket pencil on a letter-back would suffice for a most artistic representation of form and action. It happened one day in 1851 that a student at the old School of Design in Somerset House, now a successful painter, observed a youth whose appearance struck him, but whose name he did not know, to be diligently working at the remains of an antique statue,—the legs of a Faun. Hearing that he was an architectural student, the young painter commenced an acquaintance with him by expressing surprise at the then unusual devotion of time to this line of study by one whose professional intention was thus fixed. He remarked that Professor Cockerell was the only English architect, he knew, of real power in drawing the human figure. "He is my father," replied the young man, with animation and delight, "and I am trying to follow him." One idea of Professor Cockerell's, which often formed the subject of conversation, was that, for any approach to perfection, a modern building demands the co-operation of two architects, the one to devote himself to utilitarian arrangement, the other to artistic embellishment. The Professor would even go so far as to argue that no man could give equal and adequate attention to both subjects; and, having himself personal experience of such division of labour in at least one instance,* the suggestion was no bare theory. It may not unnaturally have increased what has been alluded to: the apparent indisposition of a boy to devote to the drier details of the prescribed instruction the same application as accompanied the exercise of his pencil. Withdrawn, however, in his seventeenth year from the generalities of class-rooms to a more intimate practical training, he must soon have been disabused of any uncertainty as to the requirements of actual practice. Mr. Goodchild, for many years the valued chief clerk, and through life the faithful friend, of Professor Cockerell, who as architect to the Bank of England had offices there, gave him the first lessons in perspective drawing; and new offices at the Bank were then in course of construction. Designs had frequently to be furnished for branches in provincial towns, so that there was no lack of elementary study. Identifying himself, meanwhile, with every institution connected with the architect's profession, at one time engaged among the working builders upon a scheme for a provident club in their interests, at another assisting in the business of the Artists' General Benevolent Institution, he became every day more heartily pledged, to his father's intense gratification, to share the moral responsibilities as well as the distinction attaching to his name. During the summer of 1850, with an independence then not often confided to boyhood, but forming part of the Professor's educational design, he made a sketching tour in Northern France. He returned from the beauties of Abbeville, Avranches, and Morlaix to distribute his autumn between the School of Design and some subordinate occupation obtained for him by the kindness of the late Sir M. Digby Wyatt, in connexion with the Exhibition building in Hyde Park, which, as a novel and an ingenious solution of a difficult question, was attracting great public interest. . . . .

There are marked spots in the youthful life of most men who have at any time excelled, to which may not unfrequently be traced some determination of their opinion and taste, or at least their approximation to some more or less model idea. In the profession of architecture the disposition must sometimes be suppressed, and constantly modified by the exigencies of circumstance and duty, but the impression once clearly made will never be entirely effaced. To some months of severe study at Paris in the spring of 1853, and to the admiration he there conceived as much for the system as for the results of the training in the Parisian school, must be referred a perhaps somewhat exaggerated estimate formed by Frederick Cockerell of the lofty aims and ambition of perfection which he deemed specially characteristic of French architects; and in his own earlier designs the French idea is profusely blended with the classical.

Later in that year he made a fine perspective drawing of St. Paul's Cathedral, which, with some little alterations and introduction of figures, suggested by the late Mr. Stanfield, R.A., a constant visitor at the house at Hampstead, was exhibited at the Academy in 1854. Cockerell was early in that year a pupil in the office of Mr. Hardwick, R.A., where there was a great deal of business; and under the immediate guidance of Mr. P. C. Hardwick, who found him, "from his thorough knowledge of his own favourite style of art in many cases of much use," he for the first time assisted in the planning and laying out the site for country-houses, in the construction of which he was in later years himself not unsuccessful.

One would wish that a letter from Mr. Cockerell to his son, which so emphatically determined the rivalry between painting and architecture as the aim and object of a mind delicately sensitive to the beauties and attractions of both, had been preserved. It could only have been on the most earnest conviction that the indulgent and loving father disappointed a desire so keen, and dealt a wound at the time so mortifying. For he was himself as appreciative of the glories of success as he was critical of mediocrity in painting; and his nervous pen, well skilled through years of labo-

* From a "Memorial Sketch," read at the meeting of the Royal Institute of British Architects, on Monday evening last, as elsewhere mentioned.

* The London and Westminster Bank (1837–39) was a joint production, the exterior being especially Mr. Cockerell's work; the interior was by Mr. (afterwards Sir) William Tite.

rious composition, to analyse artistic feeling and interpret every modulation of its faintest utterance, must have treated the subject with the most cogent argument and exhaustive judgment. Doubtless he rested his decision upon an estimate of his son's best powers, of which none could have so tenderly watched the development or so rejoiced in the promise. Yet it is more than probable that young Cockerell's ready acquiescence in the decree, which closed one bright avenue to his ambition, was dictated rather by dutiful obedience than by whole-hearted concurrence in the answer to his appeal. . . . .

When on entering Switzerland he parted with his friend, it was to join his family in Paris, where the first Paris Exhibition was gathering its crowds, and where his father was engaged among the English Commissioners; and more than twenty years afterwards, when visiting Chambord, Frederick Cockerell recalled an excursion thither with some of the most distinguished men of the two countries during that Exhibition summer, and of the impression made on him by the lucid criticism of Sir Charles Barry. There was, indeed, no lack of amusement in the French capital at that time; but the full love of Italy was upon him, and within a very few weeks he was writing home from Venice the most enthusiastic descriptions of its inexhaustible interest and beauty. For two months he could not tear himself away; then it was that he did some of his most careful work. As autumn waned, letters from Padua and Vicenza, from Mantua and Florence, from Siena and other charming resting-places on the road to the Eternal City, formed a journal which delighted its recipients at home by picturesqueness of illustration and evidence of appreciative study. . . . . .

Cockerell's first independent professional work was done in 1858-9, consisting of a cemetery chapel and other buildings at the picturesque little town of Ledbury, which, giving satisfaction to the townspeople, led to his building one or two small houses in the neighbourhood. His speciality came to be the design of country houses and the alteration and improvement of existing ones; and one of his earliest successes was achieved in raising the elevation and making additions to Colcorton Hall, the beautiful seat of his cousin Sir George Beaumont, which materially improved the proportion and dignity of that somewhat bizarre work of Dance. Among the more important of the many houses, which, throughout the English counties, bear silent testimony to the skill in plan and grace of execution, are Down Hall, Essex (Sir H. Selwin-Ibbetson, bart., M.P.), in the Italian style, where an excellent effect is produced by the use of concrete with decorative panels in sgraffito; Lythe Hill, Haslemere (J. Stewart Hodgson); and one of the most recent, Crawley Court, near Winchester. This is a large and imposing work, its idea a modified Elizabethan, its material brick and the grey flint of the country, with terra-cotta introduced into the window mullions, the whole effect being very light and soft. There were difficulties here connected with the site; some exceptionally fine tall trees stood in close proximity, and it was feared that any building short of being colossal would be dwarfed by them; but Cockerell managed his elevation with such judgment that the house, without being immoderately large, seems to reign duly supreme and asserts itself a successful rival to its lofty surroundings. One undeniable merit attaches to his residential buildings, the more remarkable as it indicates a feeling apart from his delight in the beauties of proportion and decorative work. If Mr. Kennard's mansion of Crawley be specially instanced, it is because it was Cockerell's largest and (with the exception of Woodcote, the seat of C. C. Cotes, M.P.) his latest completed work, and because its owner's comparatively recent acquaintance with his architect led to a strong personal friendship from his admiration of the conscientiousness and skill by which the fulfilment of his own wishes and requirements were combined with unyielding assertion of artistic principles and effect. Cockerell was always especially studious of the *genius loci* where he was called upon to build. Whether a modest rectory or a stately manorial residence were in contemplation, Nature was always duly courted in council over the projected site, its facilities and beauties harmonised with the invasion of its domain, and every less attractive feature softened by careful study and subdued. The Carlisle Memorial Column, at Castle Howard, testifies to his capacity for taking advantage of a fine position to atone for a limited expenditure by the exercise of appropriate taste; and a column in the beautiful park of Sir R. Bateson Harvey, at Langley, has been admired for its correctness of dimension and beauty of design.

He had little opportunity in the metropolis of displaying his powers; a slight but pleasing memento exists in the front and entrance to the gallery of the Society of Painters in Water-Colours in Pall-mall, and he executed a few private houses; but his only work of importance in London is Freemasons' Hall, for which his designs were selected in competition (1864).* It is marked by his distinguishing characteristics, originality and beauty of detail; the façade is rich in emblematic carving and sculpture. The highest recognition of the success within the power of the craft to bestow was shown by their architect's immediate appointment to the high office of Grand Superintendent of Works, which, although one subject to annual change, he continued to hold to his death, when, in his own Lodge where he had been greatly esteemed, the unusual tribute of three months' Masonic mourning was paid to his memory.

A reflection will occur to all who criticised in his company or conversed with him upon the works of bygone days or of those of contemporary architects; he was unusually liberal of appreciation in art. It was, for instance, impossible for any one to be more free from bigotry in favour of Classical or Mediæval school or any special development of either. With the former, naturally enough, his name was in early days hereditarily linked, but his sense of the beauties of the latter, in their proper association, was manifest in the reverent care with which he always approached the restoration or enlargement of old buildings; and his School Library and Chapel at Highgate have been approved by men whose own successes in that style give value to their opinion. But Frederick Cockerell regarded style as altogether second in importance to the great principles which underlie all beauty, and which his power of analysis enabled him in every work of merit to distinguish and to prize. Eminently catholic in æsthetics, from a naturally acute perception of beautiful things and the effect of early education, his sweetness of disposition and utter freedom from any spirit of captious detraction robbed even the most condign disapproval of offence, so that those of his younger associates who sought his judgment found in the critic the friendly teacher too.

* Illustrations of the Freemasons' Hall, Great Queen-street, will be found in our vol. for 1866, p. 613; view of the house of the Society of Painters in Water-Colours, Pall-mall East, vol. for 1875, p. 371; view of the Carlisle Memorial Column, Castle Howard, vol. for 1870, p. 347; and illustrations of one or two of his country houses in other volumes.

CLEVELAND'S IRON CENTRE.

Mr. Wilberforce, in opposing the proposed imposition of a duty on pig-iron, said, seventy years ago, that "he had never felt a more sensible pleasure in this life than when, after the lapse of a few years, he had returned to a spot once rugged and barren, but then covered by the fruits of human industry, and gladdened by the face of man, in consequence of the introduction of this manufacture." Such a change in its fullest measure has been produced at Eston-in-Cleveland. This village, almost meriting the title of town, is dwarfed in importance by its proximity to the great centre of the English iron trade, — Middlesbrough; but its history, the extent to which it has grown since the discovery of its mineral treasures, and the largeness of its contributions to the metallurgical resources of the world, render it worthy of note. In the north-east of Yorkshire there have been many changes in consequence of the utilisation of the local ironstone; but none so remarkable as that to be seen in the Eston district, and the story of these changes might almost be taken for a fairy tale. In the olden days the moors near Eston were the dwelling-places of some of those of whom its homes enclosed the undistinguishable dust,—Britons, Saxons, Danes; but in later years, it and its surroundings were practically unpeopled, and from the small irregular hamlet called Eston which stood at the foot of a detached hill called Barnaby Moor, down to the estuary of the Tees, there was a long flat sweep of agricultural land, sparsely dotted with cottages, and presenting no feature of interest. Down to thirty years ago Cleveland was an undeveloped agricultural community, and what are now the bathing-towns on its coast were then ancient little villages addicted to smuggling. The treasures of iron in the Cleveland hills have been suspected during all this century, and sample cargoes were sent to smelting-works to be rejected. But thirty-four years ago there grew a great demand for iron, and other than the usual sources of supply were found. On the coast of Cleveland small supplies were discovered, and the seam was traced slowly northwards, whilst its presence nearer the small town of Middlesbrough was sought for. An idle tale represents the discovery to have been the result of an accident; but so far from this being the case, the two discoverers of the stone, the late John Vaughan and Mr. Marley, went to the hills to find a suitable place for boring, and, coming to a quarry, they found that the ironstone was used for road-mending, and a little further on a solid rock of ironstone, 16 ft. thick, rewarded their efforts. The outcrop was followed up; suitable sites for mines were settled; and on the 2nd of September, 1850, the first lot of 7 tons of the ironstone was brought down to the highway, and thence sent to the nearest ironworks. From this date for dozens of years the Eston mines were the most prolific iron reservoirs in the world. In the few months that elapsed before the close of the year in which the mines were opened, there were extracted thence 4,000 tons of ironstone; in the first complete year of working, 187,950 tons were wrought; in 1852, 1,000 tons daily were almost averaged. From 1865 to 1875 the maximum output of from 600,000 to 800,000 tons of ironstone yearly was attained; and though the present output has been brought down to about 500,000 tons, there has been from Eston mine, in its "life" of less than thirty years, probably over 14,000,000 tons of ironstone quarried from this immense iron repository. It still employs its 1,400 miners and 150 horses; it uses engines of 600-horse power; twenty miles of railroad are laid in and about the mines; and large as is their output, it can be long maintained for the primal benefit of the little village of Eston,—swollen from a population of 200 to one of 3,000 people.

Seen from the crest of the hill, from under Eston Nab or Beacon, the mining village shows its scattered streets of cottages straggling to the foot of the hill, where long inclines are dotted with trains of ironstone-laden or light wagons descending or ascending, whilst, higher up, at the "tipping cradles," there is a continuous rattle as the small mine-wagons bring out from the gnomes in the hill the fruits of their labour, and discharge the greyish-green ironstone into the railway trucks. Below the busy little village are ranges of worksheds for joiners, wagonwrights, and other trades; and along an extended plane to the mouth of the Tees, from great gantries, there is, through a fertile agricultural tract, the dark streak of the private railway that leads to the smelting-works at South Bank, seen near the line of the river under its canopy of smoke.

South Bank is a station on the line between Middlesbrough and Saltburn, and Vulcan could have had no better representative station. The traveller who approaches it from the hills sees great inclines of slag and clay-blocks, ranges of calcining kilns "breathing forth,"—not threatenings and curses, like he of Tarsus,—but clouds of smoke and stour; great sets of blast furnaces now yielding dense clouds, and then emitting tongues of flame, pale in the day's light; and a long range of sheds where steel rails are writhing red-hot as they take shape between the rollers, and where the converters throw up great sheets of fire. This is the largest pig-iron producing centre of the world; the primal place of Cleveland iron manufacture, and also the first of Cleveland steel. Fourteen immense kilns roast or calcine the ironstone for one of the sets of furnaces, and, altogether, there are, at this iron-making village, twenty-five blast-furnaces, which represent a capital of probably half-a-million, and the capacity of production of which is twice as much as that of Belgium! But the age of iron is giving place to that of steel, and there have more recently been constructed steel works which roll out from the ingots of steel 2,000 tons of rails weekly.

This centre of the steel and iron trades is divided into two unequal portions by one of the main branches of the North-Eastern Railway. The line is flanked on either side by the stacks of blast-furnaces, and in the night-time there are few more striking features than it presents.

Rows of furnaces are seen by the glow which spreads from the issuing molten metal, through the interstices of trains of coal, coke, and iron-stone wagons; and by the occasional blast-flame that high above casts a lurid light down upon the scene. Farther on there are long sheds in which little engines are seen darting about with great ingots of steel red from the ingot-mould, or white-hot from the heating furnace. Long bars of steel are being forced by powerful rollers into the double-headed shape of rails; and there is the sound of punching and testing and loading these. The flaming converters, where the pig-iron is purified of some of its vitiating elements, are among the most striking sights. Egg-shaped, there issues from what might be called the spiked end a great volume of flame, which rises many yards into the air as a fierce blast rushes furiously through the molten iron, burning out as it goes superfluous carbon, and marking the state of its work by the variations of the flame. In that fierce blaze the works are lighted up, and for yards around the place is as light as at midday. Around furnaces, converters, mills, and forges, there are the dwellings of the workmen,—dwellings that seem dingy in the most sunny day; for, hemmed in by banks of slag, by smoking kilns and flaming furnaces, by great sandy furrows where molten iron assumes hues of red, dull brown, and then its normal grey,—surrounded by these, and by the smoke-laden atmosphere, there could be nothing but the dingy dwellings where the industrious dwell. Year by year this transformation of the irony earth of the honeycombed hill into railway or ship-building steel or merchant-iron goes on, and year by year the great iron-mining centre of Cleveland is losing its rural aspect, and losing its village characteristics, and putting on the dress and the institutions of towns, whilst it causes the fields and the waste lands round to be "covered by the fruits of human industry," and populated by a hard-working people.

CONSTRUCTIVE ART IN JAPAN.*

THE Budhist Temples almost invariably have tiled roofs, and the enormous weight of woodwork and tiles is supported upon pillars, placed at intervals of 6, 12, and 18 ft., the widest openings being in front of the altar.

Besides the main building, there are the lesser shrines, the priests' residence, and extensive out-offices. In some localities the groups of temples cover large areas; for instance, those at Shiba, in Yedo (now called Tokio, or Eastern Metropolis). The wealthy families visiting the cemeteries required accommodation for their periodical visits in state, and extensive suites of reception-rooms were erected for these purposes.

In recent years these apartments were found most convenient for the foreign *employés* of the Government until suitable buildings were erected, and it was in some of the larger temples that the Legations and Consulates were located. Ancient precedent was followed, and the fiction kept up to the last, that no foreigner could gain more than a guest's footing in the country. In olden time refugees and castaway voyagers were always housed in temples.

Pagodas, unlike those of the main land, were constructed entirely of wood, in five stories. This number five is one of those frequently used by Indo-Chinese nations under which to group associated ideas, *e.g.*, the elements, the virtues, the senses, the passions, &c. Thus we have,—wood, fire, earth, metal, water, the five elements; benevolence, righteousness, propriety, wisdom, truth, the five virtues; &c.

These pagodas are not numerous; there is a very fine one in Osaka, and two in Yedo. There are four balconies, with overhanging tiled eaves, and the roof is surmounted with a spire, the design eminently Budhistic, of metal, and from 12 ft. to 18 ft. high, the entire building, exclusive of this spire, having an altitude of 60 ft. to 80 ft. They are invariably square, whereas the Chinese and others are usually octagonal, and the overhanging eaves measure from 16 ft. to 20 ft., the same measurement being adhered to for all five stories. A centre-piece runs up through the building, from which radiate the principal rafters and beams of each story, supported at the corners by strong pillars with intermediate uprights. Cross beams and ties, as we would use them, are not seen, and the heavy timber is much weakened by the system of mortise used.

There is very little ironwork, copper was exclusively utilised (?), thin sheet metal being elaborately displayed at corners, &c., for ornamentation, forming a contrast to the crimson lacquer and gilding so profusely used formerly in all Budhist buildings. The carving, colouring, lacquer, and gilding, so opposed to the native ideas of purity and simplicity, was confined to the temples of the wealthy sects, which continued to retain their Indo-Chinese character with little change.

The influence of the Christian teachers of the sixteenth and seventeenth centuries left little behind in the religious or domestic architecture that we can now trace. The fortified sites, the great citadels of the chief cities and provincial centres, bear strong traces of our early European feudal systems; in fact, several of the most important of these strongholds were constructed since the advent of the Jesuits and other teachers from the West.

A strong natural position being selected, the conformation of the land was availed of; that of our own Windsor Castle bears a striking resemblance to some of the sites selected. A series of deep moats being excavated, the material was thrown inwards, and the natural elevation materially increased. A facing of large blocks of stone of a pyramidal form, the apex inwards, was constructed, commencing at an acute angle, gradually gaining the perpendicular. At angles the stones were in regular courses, but only there and in the top courses. Piling was resorted to extensively. In p. 540, *ante*, the mode of driving piles and ramming foundations was mentioned. Stone walls and masonry proper are not seen in Japan. Inside of the moats a high bank is often seen, the plane facing of the moat being thus carried up to a more imposing height, and affording a greater protection against the missiles of an enemy. Along these, pine trees, *Cryptomeria Japonica*, *Chamæcyparis obtusa*, *Abies firma*, *Quercus dentata*, and *Planera Japonica*, were planted, and also, in more recent times, the flowering cherry. Some of these pines are noble specimens of forest trees.

The Imperial residences are remarkable for their simplicity and absence of ostentation; following closely the pattern of the Shinto shrine, the official reception-halls and the private apartments vary but little from those of the nobles and wealthy.

It is, or rather was, some years ago, in Yedo that palaces were to be seen to the greatest advantage. The cheapness of material in the provinces gave opportunity for some provincial chieftains to erect large buildings within their palace grounds, but all followed the same plan,—large official halls connected with smaller buildings by passages, the private apartments being suites of small rooms of the common domestic type.

Official buildings were not of so solid a character, and the official palaces of the higher officials were wanting in the elegance and comfort of the private residences.

The streets and houses of tradesmen varied with the locality and the means of the occupiers, as with ourselves, while the farmers and farm-labourers were content with very primitive homes.

The houses of the common people were devoid of all privacy; even the life of the better class was exposed to the publicity incident to having numerous servants in the houses, and the close association between master and servant. The fragile nature of the partitions precluded privacy, even if loneliness were desired. Foreigners were obliged to first live in the temples, and then in the houses constructed on the native model, glass being substituted for paper in the outside sliding panels that did duty for windows. Gradual progress was made; strong frames, copied from American and colonial models, were erected, and on to these tiles were nailed. Then bricks came into use, and recently attempts have been made to build warehouses and even residences of brick and stone,—the Masonic Hall, Yokohama, the British Legation, Tokio, and Walsh, Hall, & Co.'s tea warehouse, being early instances of a marked step in advance, even in the face of dread of the frequent severe shocks of earthquake.

Natives have within the last eight or nine years endeavoured to copy our models, but frequently make some very quaint and striking additions of their own.

Under the direction of the first foreigner employed as surveyor-general Mr. Waters, and since, Mr. MacVean, the Japanese have availed themselves of the opportunities afforded by extensive conflagrations to erect on the devastated sites a new class of house, and several long streets of buildings of brick, &c., have been erected.

The fireproof buildings, common throughout Japan, seem to have fairly well answered the purpose. A wooden frame and bamboo construction for the thick mud-plaster, laid on, layer over layer, on both sides, to the thickness of an armour-clad's turret, is gradually dried; a coating of lime on the outer-side, tiles on the roof sometimes. A separate frame and temporary shed over it is often to be seen, which is pulled down if fire breaks out. A weather-board covering of thin *cryptomeria* is attached by hooks, so as to be easily torn off also. The tiles used in roofing are but slightly burnt, and therefore are not very durable; the form seems to be taken from the ancient mode of using split bamboo sections, concave and convex halves alternately.

Shingles, being cheaper, are extensively used where cheapness is the object, their lightness requiring a less massive building to support the roof. Thatch is universal in the rural districts. The flooring is invariably matted, excepting the outer passages, and this matting is laid on pine boards ½ in. thick, which are supported on light joists, supported at intervals of 6 ft. and 9 ft. on uprights resting on stone, and 3 ft. to 4 ft. above the ground.

In two-storied houses the under-side of the flooring, planed smooth, forms the ceiling: in the better fitted rooms a light ceiling is added, and upon this a compass card is placed, so that sleepers may not lie with their heads to the north, the position of the dead.

C. FOUNDES.

* See p. 1306, *ante*.

SKETCHING FROM NATURE.

AT the London Institution, Finsbury-circus, on Thursday evening, the 11th inst., Mr. Walter Severn, the water-colour painter, delivered an interesting lecture to a crowded audience on "The Art of Sketching from Nature in Water-colour," which was practically illustrated by some excellent drawings.

Mr. Severn commenced by saying that this art had until recently belonged almost exclusively to England, and they associated with it such well-known names as Cox, De Wint, Muller, and Cotman, whose best works might be said to partake more of the nature of sketches or out-door studies, possessing a certain completeness, than of finished pictures. The distinction between completeness and finish emphasised what he was going to say. To do what he called a complete sketch one must catch nature in one particular mood, not easy in a climate like ours. This required dexterity and rapidity, qualities so obviously necessary that even Professor Ruskin, who had written so usefully about careful work and finish, now said that "good painting can only be acquired by rapid and various practice from nature." It was reported of Fuseli, R.A., that in reply to some question as to his mode of painting, he said, "First, I sits myself down,—then I works myself up,—then I throws in my shades,—then I pulls out my lights." He (the lecturer) proposed for the introductory part of his lecture to make use of these quaint utterances of the eccentric Academician. First, with regard to sitting down, he wished to impress upon those who paint out of doors how necessary it was to be comfortably seated, and to have all their things what was called "ship-shape" round about them. Any mishap, such as upsetting the water-bottle, or losing their brushes in the grass, might prove serious if they happened to be at work upon a changing cloud or fleeting shadow. He did not like three-legged stools, but four-legged ones, upon which they could sit for a long time without feeling tired. He did not think that any one should work at a landscape out of doors for more than two and a half or three hours. In addition to the trouble caused by changing effects, they were likely to feel tired, and this was fatal to good work. Except for small drawings, easels were indispensable, and he found a second camp-stool to hold his paint-box very useful. He could not paint earnestly or apply his mind vigorously unless both his hands were free. The art of painting was quite difficult enough without making it more difficult by a want of comfort. Millais told him not long ago that when he had a landscape to paint he often had a

small house, built with plate-plass window and fireplace; but, without going quite to that length, they could, with very little trouble, make themselves sufficiently comfortable. It was useless trying to paint if they were hot and tired. The student was more likely to excel if he was pleased with his subject. The true artist ought to feel some sort of excitement or enthusiasm when looking at a beautiful scene. The fewer colours they could do with the better. Too many would only confuse them, and they should remember that dried-up colours would wear out their best brushes, and they should not try to work with brushes that were worn out. In regard to throwing in shades, it might be said of all things that they ought not to look painted, but this might be said emphatically of shadows. Remember that shadows were caused by the absence of direct light, and that a shadow on the ground or on trees represented a part of the landscape as it would be if the direct sunlight were obscured. This would prevent them from making their shadows too black or dark,—a very common fault. In painting rocks or cliffs they should observe that in every hole or crack the shade would be full of reflected light from the ground and near objects, especially if the day was sunny, and all the upper edges would have cold bluish lights from the sky above.

In the afternoon and at sunrise, when the sun's light passed through a medium which absorbed the blue rays, and the lights on the earth became warm, the shadows might be cool, but generally and certainly in broad daylight, the shadows were warm. The distant shadows on hills and cliffs often appeared to be more blue than they really were, especially to beginners. Rose madder, light red, or vermilion, would neutralise the blue, and even a little yellow must at times be necessary; but the greatest care must be taken to preserve an even surface in shadows. Ragged shadows would spoil any drawing. What made near surface shadows often appear so very distinct was not that they were especially dark, but that they were in strong contrast with the surrounding light. To get this contrast he thought the shadows must be painted as transparently as possible, and a small amount of body-colour might be mixed with the lights.

In regard to lights, there were four ways of rendering them, called technically "leaving out," "rubbing out," "scraping," and putting on with body colour. These methods were quite distinct, and the adoption of any particular one made it necessary to use particular paper. Paper that was absorbent, like Harding's, took body colour readily, but would not stand scraping out; so he generally used the thin rough Whatman, which, when strained on a board, would stand anything. It was particularly useful, if they wanted to work up their sketch afterwards. All kinds of knives were now used for scraping. It was easier to scrape out a small light than to leave it. Thin rough Whatman would stand scraping very well, and they could easily get any scraped part even by stippling. By stippling they could get evenness and flatness, and also distance, finish, and texture. The finer stippling was done by filling up with rather a dry brush every light speck or inequality, and modifying every dark mark, until the whole surface looked even and uniform. Any background done this way would make objects which were left or erased stand out very plainly. Rubbing and taking out might be done softly with leathers and roughly with rags, and, of course indiarubber and bread would take out any part of the colour which had been wetted. He thought it was very important to have plenty of rags—nice, old soft rags—and never to use them after they were soiled. They had been told how Turner used to drive the wet colour to the edge of a dark or a light, although he was not given to many dodges. Let them keep their lights clear, and tone them down gradually. A small amount of bright paint used with much water was often more valuable than a large quantity of dull colour.

In respect to "glazing," or putting one colour over another instead of mixing them, it was discovered by the old masters that the system was important, not only to secure brilliancy, but to ensure permanency. Chemical changes were apt to take place if colours were too much mixed. He believed that a sketch from nature would often lack freshness and brilliancy if all glazing were ignored. As they had warm and cold, transparent and opaque, colours, they should use them in the way most likely to aid the artifice of painting. He did not agree with the theory that shadows and lights should be painted in exactly the same way; on the contrary, he thought the student should try and vary his methods, just in the same way that an engraver used dots, lines, and irregular work to imitate flesh, drapery, or foliage. He agreed with Professor Ruskin that placing transparent and opaque colours in juxtaposition should not be carried too far, so as to become a mannerism or a trick; still he thought all students should bear in mind that variety of treatment was the direct means of securing variety of effect.

In respect to tones, nothing was more puzzling to beginners than to determine between two very opposite colours as to which was the darkest in tone. Instead of merely observing whether a thing was brown or green, or blue, they should acquire the habit of judging whether it was warm or cold, and what was its tone in relation to objects near. This was of so much importance to secure the completeness or truth that they should try for a few seconds to look at nature with the eyes of an engraver who had to copy a coloured picture without colours. The help of slightly grey spectacles would help them to do this. He used them also to keep off the glare of the white paper when he was first drawing his subject. The most serious mistake made in reference to tone was that of making a red setting sun darker than the sky through which it shone. They could not have a better study of tones than snow-covered ground, especially in the evening, or their beautiful white chalk cliffs. Every projection had several faces which took different reflected lights, and every hollow was full of warm light which, if not painted rightly, would prevent the cliffs from looking white. Referring to perspective, the lecturer said that by the simple carpenter's rule they could measure any angle and trace it on the paper, and if tested by the strictest rules it would be found that this method was quite correct. As to measuring, he was pleased to find that their great art-critic now permitted them to measure as much as they liked. He thought even tracing might be done if it would help to secure correct drawing. It was only by tracing one side, after getting the other as correct as possible, that he could paint the "Tombs of the Caliphs" he exhibited to the meeting. The most important thing was to select subjects to paint which had what the Italians called "*motivo*,"—some feature which attracted attention,—some marked light or dark,—something that would give special interest to their drawing. Without this the most praiseworthy sketch might be tame and uninteresting. They should try to make their drawings tell a story. A ray of sun, a passing shadow or shower, or a rainbow, might appear opportunely. To do these they must be rapid, so should take care that their apparatus was complete and simple. Sun, wind, and rain might prove awkward customers; and as to midges, without a veil they would crush the artist. In painting masses of trees or other objects reflected in water,—what the poet Keats called

> "A crystal mocking of the trees and sky,"—

they would find that two or three brushes ready charged with different colours would enable them to paint the variegated downward streaks quickly and with the blended effect they had in nature. He thought that slightly troubled water might, like everything else, be painted on a system, or with the knowledge of some system. If they watched a large surface of undulating waves, not caused by direct wind, they would observe that they had the appearance of hundreds of irregular diamonds or ovals, and after studying these carefully they would observe that the hollows and sides reflected separately the different objects above or opposite to them. Cliffs, trees, and clouds would all be reflected, downwards, in broken streaks, through these diamonds. An artist had this great advantage over a photographer, that he could give effect to peculiar features. Sir Edwin Landseer might be quoted as the greatest example of an artist who knew exactly what to leave out. If they found that they must take out an object which they had painted in rather strongly, they should use a small Turkey sponge. For subduing or softening they should use large brushes, and a hog's-hair brush was valuable for some kinds of work. If they wanted to get a large sky even and soft, it was a good plan to lay their drawing flat, and work over the sky with plenty of water. If a drawing looked hard and dry, they should give it a bath; but this required experience, and it was better to try their hand on some old sketches. Not only in painting, but in everything, knowledge was best acquired by actual experience. His hearers should not mind a few failures; they would teach them quite as much as successes. Prof. Ruskin said that the most distinctive charm of water-colours as opposed to oil was the visible merit of hasty skill and the entertaining concurrence of accidental felicity. By degrees they would acquire more and more certainty, until at last they would know what they were going to do. That was a sign of real advance. They should never object to criticism. He had even found the remarks of children useful. Self-satisfaction was detrimental to good work. It should be remembered that perfection was not to be attained in art. The greatest artist was always learning and never reached the goal towards which all his efforts were directed. They should learn to rely upon themselves. Sir Joshua Reynolds said that the rules of art were few and easily learnt, but Nature was too infinitely various, too subtle, and beyond the power of retention of memory. They should, therefore, constantly study Nature and accumulate facts, never forgetting that all good art depended upon a subtile choice of what was most beautiful, interesting, or necessary to the work in hand. His (Mr. Severn's) late sister, Mrs. Newton, said of portrait-painting that it ought to be "the truth lovingly told," and this remark applied equally to landscape-painting. Good painting consisted in generalising by short and simple methods. All painting was an artifice,—a deception. Objects must be made to look real upon a flat surface. To make a picture required a broad, comprehensive grasp, which, as Reynolds said, denoted genius more surely than any other quality. In conclusion, the lecturer advised them to lose no opportunity of observing Nature,—to look at all things worthy of notice and study them, to observe closely how the lights and shadows fell, and to make notes of colours. They should fill lots of sketch-books, and if they could not find a kindred spirit to go with them, should go alone. Others might feel solitary, but the student of art ought not to know what it meant. Truly might it be said of him or her, "Never less alone than when alone."

THE LAW OF FIXTURES.

INSTITUTION OF SURVEYORS.

In the discussion which ensued on the reading of Mr. Smalman Smith's paper,* read on the 24th ult. before the Institution of Surveyors,

Mr. R. C. Driver said that the Institution was under great obligations to Mr. Smalman Smith for his paper. As every surveyor knew, the law of fixtures was most unsettled. His own experience extended over some forty years, but so uncertain was the law that he had always found it advisable, in offering a property for sale, to specify exactly what the vendor intended to sell, as otherwise great difficulties might arise before the purchase was completed. There appeared to him to be some divergence between the custom in these matters, and the law as defined by the author of the paper. In giving decisions with reference to fixtures, the judges seemed to be in the habit of taking what might be called a liberal view where it was a question between owner and heir and owner and executor; but in cases of mortgage between parties who were strangers to each other a stricter method of interpretation was adopted.

Mr. E. J. Castle said that in his opinion the question of fixtures or no fixtures was not so much a matter of legal definition as one of fact, and the difficulty of applying the legal decisions seemed to him to be due to the circumstance that the judges were apt to decide questions of fact instead of leaving them to be decided according to the evidence of skilled witnesses. Consequently, there were most conflicting decisions on all points. He believed that it had been held that an ordinary window-sash was removable by a tenant as not being fixed, whilst a gasfitting that was soldered to a gas-pipe had, he believed, been held to be not removable. If this were so, it seemed contrary to the practice or custom of dealing with a tenant's right to remove. So in the case of a clock. The one in the room was, no doubt, removable, though fixed to the wall, but no one would, in the case of the Westminster Clock Tower, say that the large clock there was not part of the freehold. Thus

* See p. 1323, *ante*.

a clock might be a mere article of furniture in one case, and in another it might be an important part of the building, and pass with the premises.

Mr. E. Ryde said he had understood the author of the paper to say that the question of fixtures or not fixtures often depended on the circumstances under which the property was held,—whether in the hands of a tenant or the owner,—and he wondered how, under such a state of things, the property would be valued for rating. To his regret the paper had not entered into that part of the question. It was stated in the paper that whatever is fixed to the realty, so as to be irremovable as between landlord and tenant, must be taken to be part of the premises for ascertaining the rateable part of the property; but it had been decided in the West Ham case that a tank which actually formed the roof of part of the premises was not a fixture and not to be taken as part of the rateable value.

Mr. E. P. Squarey observed that Mr. Smalman Smith had done the Institution great service in preparing so able and luminous a digest of the law of fixtures. The paper showed how numerous were the pitfalls in the path of those who were called upon to deal with this subject, and so clear a compendium of the law as Mr. Smith had prepared could not fail to be of great use, especially to the younger members of the profession.

The discussion was resumed on Monday, the 8th inst. (Mr. E. Ryde in the chair), when

Mr. F. Vigers observed that the paper would certainly be very useful for reference, for no doubt Mr. Smith had given a lawyer's view of the question as regarded fixtures between the heir-at-law and the executor or remainder-man, and also between landlord and tenant. But it was desirable that the views of surveyors, who had to deal practically with these questions, should be put upon record. When questions relating to fixtures came before courts of law, the difficulty was that the question of construction could not be very accurately brought forward, owing to the nicety of the distinctions. In deciding the question whether a particular fixture formed part of the freehold or was only so affixed as that it could be considered a chattel, removable by the tenant, the distinction was sometimes very fine indeed. He remembered upon one occasion that upon a question of fixtures which was thought to involve some very nice points, it was said by the legal representatives of the parties, "Let us refer it to two surveyors for arbitration, and appoint a legal umpire." That course was adopted, and Mr. (afterwards Mr. Justice) Willes was appointed umpire. He (Mr. Vigers) happened to be one of the arbitrators, and he remembered that Mr. Willes gave them an appointment one morning before breakfast to view the property in dispute, and the difficulty was to make Mr. Willes understand why one thing which appeared to be very firmly fixed should be a tenant's fixture, and why another, which really appeared to be not more firmly fixed, should be a freeholder's fixture. Standing before a register stove he asked, "I am to understand that this is a tenant's fixture. Why?" The reply was, "Because it could be removed from its place without injury to the freehold." "Then," he said, "am I to understand from you that if I apply sufficient force to this stove I can move it bodily out?" He was answered in the affirmative. He then said, "Here is a mantel-piece; what do you say to that?" He was told that it was a freeholder's fixture. "But," he rejoined, "if I apply sufficient force to it, that also can be removed!" The arbitrators reminded him that, though the mantel-piece certainly could be removed, it could not be removed without injury to the freehold. He went through a variety of items in that way, and at last he said,—"Gentlemen, I have arrived at the conclusion that this is a matter which is much better settled between surveyors than by a lawyer. I advise you to appoint a surveyor as your umpire," and he retired. The arbitrators did appoint a surveyor as their umpire, and the case was settled without very much difficulty, and to the satisfaction of all parties. For every ten cases relating to fixtures which came before the courts, thousands were settled, and satisfactorily so, between surveyors, to whom Mr. Smith's paper, embodying as it did the leading principles of the law, would be of very great value.

Mr. Hugh Shield, barrister-at-law, said that Mr. Vigers seemed to think that lawyers should, as a rule, be excluded from the settlement of these questions, a doctrine to which he, as a lawyer, could hardly be expected cheerfully to subscribe. He had no doubt whatever that the late Mr. Justice Willes would, in the case referred to, have decided very fairly between Mr. Vigers and his brother professional arbitrator. If, however, Mr. Vigers was only claiming for surveyors an essential and necessary voice in the settlement of such questions, he quite agreed with him. He was there to bear his testimony to the very great merit exhibited in the paper. In dealing with a legal subject, it might pretty safely be said that that treatment of it would be most satisfactory which aimed at and succeeded most directly in bringing it under the governance of one or two leading principles, and the merit of Mr. Smith's paper lay in the fact that it sought to bring the whole subject under one guiding principle, that guiding principle being the determination of the intention with which the fixture had been affixed to the soil. All the other aspects of the question really led up to that. Under the guidance of that principle, Mr. Smith had been able to arrange his subject in perfectly logical order, and had given a harmonious and comprehensive view of the whole subject. In conclusion, Mr. Shield made some remarks upon the subject of the rating of fixtures, chiefly with reference to the Bishopwearmouth case.

Mr. H. Lofts said it appeared to him that Mr. Smith had given a very lucid legal analysis of the question. He had had a good deal to do with the subject, especially in relation to house-property, and he would suggest that instead of calling the two descriptions of fixtures "movable" and "immovable," it would be better to call them respectively tenant's fixtures and landlord's fixtures. He thought it was a generally-recognised principle that if one could not take anything away without making a dilapidation, it became a landlord's fixture. Wherever it was possible, it was a good plan to take as a guide the surrendering clause of the lease, which generally specified what the landlord might claim and what the tenant might claim. Mr. Smith, in his paper,* had stated that chimneypieces, if ornamental and set up by the tenant, were movable fixtures, but his (Mr. Lofts') experience was that they could not be removed without causing a dilapidation; and he knew of a case in which the Duke of Westminster brought an action against a tenant for removing a chimneypiece from a house in Grosvenor-square. Again, Sir Dudley Majoribanks, at his house in Brook-street, had a Canova chimneypiece, and he reserved the right to remove it on paying a certain fixed sum. Whenever a property changed hands an inventory should be made of the fixtures, and that inventory, duly attested, should be preserved for future reference. It would, he thought, be very advantageous to the profession if the Institution of Surveyors would, not only for house-property, but for farms, trading concerns, and other properties, arrange a code of rules upon the basis on which the question of fixtures could be settled permanently.

Mr. S. W. Casserley said that the law of fixtures was, theoretically, very simple, and might be said to be embodied in the maxim introduced into the paper,—*quicquid fixatur solo, solo cedit*, and the application of that principle by the courts, and the development of it, were sufficiently shown by the cases which Mr. Smith had brought forward. But for every single case reported in the law-books, there were thousands of cases in the memory of men of practical knowledge which illustrated that view of the law. He thought Mr. Smalman Smith's paper was extremely well done, and the members of the Institute were very much indebted to him for his industry, for he had given them a fair general view of the law of fixtures. If he might be allowed to say so, it was a very good "reduced plan" of the law. Considering the complexity and magnitude of subject, he thought the members could not but feel towards Mr. Smith much as the rustics in the "Deserted Village" regarded the schoolmaster,—

> "And still they gazed, and still the wonder grew,
> That one small head could carry all he knew."

Viewing, however, Mr. Smith's treatment of the subject as a "reduced plan," it would be found to have some of the characteristics of a reduced plan, or, in other words, some of the points would be found to be dwarfed, and one or two might be omitted. Mr. Smith, for instance, in his paper had said that in the absence of special contract, tenants' fixtures could not be removed after the termination of the lease, and that that rule applied whether the lease determined by effluxion of time or by re-entry on forfeiture. That was perfectly correct so far as it went, but Mr. Smith might have added that it depended upon whether the fixtures were intended to be removed by the tenant or by the assignee of the tenant, for the law was that an assignee might remove fixtures even after the lease had been surrendered.

Mr. Robert W. Mann said that while fully appreciating the value of Mr. Smith's paper, he differed from one or two points in it. In cases of annexation to the freehold, he had seldom found any difficulty in settling questions of fixtures when meeting brother-surveyors. Difficulties more frequently arose between landlord and tenant, or rather between their solicitors,—for as far as his knowledge went, solicitors did not seem to have made themselves acquainted with the law of fixtures. He did not see the advantage of changing the terms "landlord's" and "tenant's" fixtures into "immovable" and "movable" fixtures, for the former terms showed, *à priori*, to whom the fixtures belonged. If there were to be any changes in the names he should suggest that they should be called "freehold" and "leasehold" fixtures respectively. He agreed with Mr. Vigers in thinking that it was desirable to append a schedule of the fixtures to the lease. Some twenty-five years ago, it was almost the universal custom for a tenant to provide stoves, grates, ranges, baths, bells, &c.; but now all that had been changed by the speculating builders, who in their competition for tenants and purchasers, now generally provided all those things, and other things, almost approaching the nature of planned furniture, besides. He agreed with what had been said as to mantel-pieces. If a tenant replaced a chimney-piece worth 50*l.* by one worth 1,000*l.*, when once he had fixed the latter to the freehold, he could not remove it unless he had the consent of the landlord in writing to replace it by the original chimney-piece. That course was frequently taken. In practice, the difficulties which arose were not, as a rule, so formidable as might be supposed by those who were not practical surveyors.

Mr. W. G. Harrison, Q.C., said that if he were speaking as a surveyor and not as a lawyer, he should say that the whole subject of the law of fixtures was a hopeless muddle. Almost invariably the question of fixture or no fixture was a question of fact, and not a question of law. Admirable as was Mr. Smith's intention in preparing the paper, it was very rash to generalise on such a subject. Nearly all the authorities cited by Mr. Smith were no authorities at all. The judges' decisions quoted were not decisions on questions of law, but decisions on questions of fact, and probably if those questions of fact had been submitted to juries their findings would have been diametrically opposed to the findings of the judges. He (Mr. Harrison) denied the truth of the maxim quoted by Mr. Smith,—"*quicquid fixatur solo, solo cedit.*" It was necessary in dealing with this question to consider what were the rights of the holder of the estate. In all dealings with fixtures it would be advisable that they should be made the subject of legal and well-drawn agreements, so that it might be seen at a glance whether a man meant to convey the bare walls alone or anything more. The conflicting decisions quoted by Mr. Smith had produced unnecessary and intense confusion, and, indeed, the muddle into which the question had got could not be better shown than by the use of such a contradiction in terms as "movable fixtures." In dealing with the cases, the courts drew inferences from the facts, and their decisions, based on those inferences, were then quoted as law! With Mr. Ryde, he regretted that a subject of so much interest to surveyors as the law relating to the rating of fixtures was dismissed in a single paragraph, but he was not surprised, because it could not be satisfactorily discussed within the limits of a paper, it being purely a question of facts. The main questions were questions of facts, which could be very much better dealt with by practical men than by lawyers. The whole subject was unscientific from beginning to end. Very little was known of it, and his advice was,—Deal with fixtures as a matter of express agreement. But, it might be urged, "Surveyors have to deal with these matters after people have failed to deal with

* See p. 57, vol. xii., of the "Transactions" of the Institution of Surveyors.

them in that way!" True, and therefore, to surveyors he would say,—Apply the rules of good sense.

Mr. P. D. Tuckett wished to add his testimony to that of previous speakers as to the great value of Mr. Smith's paper as a concise summary of the law on the subject. There was a common proverb which said that "a little learning is a dangerous thing," and while it was undoubtedly necessary for surveyors to know something of the law of fixtures, they should leave all strictly legal business to the lawyers, or they would be likely to find that "a little law is a dangerous thing." When a surveyor was required to go over premises and value fixtures without any special instructions as to what he was to value, he would give a lot of trouble to everybody unless he had previously taken some pains to make himself acquainted with the law on the subject. It seemed to him that one of the difficulties which attended the law of fixtures consisted in the very few decisions which had been given by the courts on the subject. There was an immense number of questions arising about fixtures every year, not to say every month, and those questions were constantly referred to valuers and surveyors up and down the country, many of whom were quite ignorant of the niceties of the law on the subject, but who nevertheless decided such questions between landlord and tenant according to their idea of custom or upon general principles of common sense. In the majority of such cases the amount in dispute was not sufficient to make it worth while to take the opinion of a court of law. The consequence was that there was springing up here and there a method of dealing with questions of fixtures which materially differed from the method of the courts. There was one point, towards the end of the paper, as to which he thought that Mr. Smith had gone a little too far. He stated that "a general covenant to repair extends not only to buildings, but to fixtures, and a tenant is precluded by such a covenant from removing fixtures," and he subsequently stated that if "a tenant from year to year, or without any express covenant to repair, erects structures or improvements, and subsequently takes a lease of the same premises, with a general covenant to repair, the lessee would be restrained from removing those fixtures at the determination of the tenancy so created, although he might have removed them previous to the commencement of his lease." Now, if that were really the state of the law, it would be impossible practically to enforce it without a great many disagreeable and violent scenes.

Mr. W. Eve agreed with what had been said by previous speakers as to the importance of taking inventories of fixtures when property changed hands. He thought that one effect of Mr. Smalman Smith's paper would be to induce surveyors to endeavour more than ever to settle disputes as to fixtures without bringing them into court.

Mr. E. J. Smith said that as reference had been made to the Bishopwearmouth case, he might mention that a very able pamphlet on that case had been written by Mr. Potts, of Sunderland, a member of the Institution.

Mr. Watney and Mr. A. C. Meysey-Thompson having made a few remarks (the latter gentleman offering to contribute a paper at some future time on the rating of fixtures),

Mr. Smalman Smith proceeded to reply on the discussion. He said it seemed to him that some of his learned friends, and some members of the surveyor's profession, had laid too much stress upon the point,—involved, no doubt, in the consideration whether an article annexed to the freehold was a fixture or is not,—that it was a question of fact, and not one of law or theory. Now he admitted that in many instances, and important instances, questions of fact were involved in determining the questions in dispute; but of what use was it to determine the facts unless there was a theory to apply to those facts? Where was the advantage of determining the isolated facts unless they could be made use of? In preparing his paper his only object had been to endeavour to reduce the complicated, intricate, and confused subject to something like a consistent theory which should serve as a guide for surveyors when they came to consider the facts which had been insisted upon as all-important. He believed that it was the first time that any attempt had been made to formulate such a theory, and he had been encouraged to make the attempt by the perusal of the judgments of one learned judge (Mr. Justice Blackburn), who had done more, probably, than any other judge, towards determining such a theory. The leading general principle upon which he had proceeded was the intention of the party in annexing the fixture to the freehold. Mr. Harrison had said that that was a question of fact and not one of law, and had denied the applicability of the maxim quoted at the outset of the paper,—*quicquid fixatur solo, solo cedit*,—and contended that such a state of things as it implied no longer existed. But the whole object of the paper had been to show that such a state of things did not now exist. The maxim was a relic of the old feudal system, and had now almost ceased to have any effect. In conclusion, Mr. Smith expressed the hope that the Institution would endeavour to formulate some comprehensive schedule of fixtures of all classes, so as to (at any rate in the great majority of instances) prevent the disputes that now so frequently arose.

The Chairman (Mr. E. Ryde) closed the discussion by making some observations supplementary to those made by him on the evening the paper was read. He remarked that Mr. Smalman Smith's paper might be regarded as a complete index to the law of fixtures. The question, in the minds of practical men, naturally divided itself into three parts,—Firstly, What is a fixture? Secondly, In whom is the property of the fixture? Thirdly, What part does a fixture play as a portion of a rateable hereditament? He should have liked to hear the discussion turn more upon those points than it had done. Very little had been said as to what were not fixtures. On many trade premises there were things which were not fixed at all, though necessary for the carrying on of the trade for what the premises were built. It seemed to him that common sense would say that a thing which was not fixed or "annexed" could scarcely be called a fixture. It had been suggested by one of the speakers during the discussion that the immovable fixtures should be called landlord's fixtures and the movable ones tenant's fixtures, but it was possible to conceive of cases in which both landlord and tenant might be possessed of fixtures belonging to each category. He agreed with Mr. Mann that in demising property it was advisable to set forth in the lease exactly what was demised, and the same precaution should be taken in selling property. With regard to the rating of fixtures, reference had been made to the Monkwearmouth case, and to the very able pamphlet which had been written by Mr. Potts, of Sunderland. The pamphlet was in the Library of the Institution, and was well worth reading.

The meeting closed with the announcement that on Monday, January 5, 1880, Mr. E. R. Robson will read a paper on "The Purchases [of land] of the London School Board."

UTILISATION OF THE TIDES.

LIVERPOOL ENGINEERING SOCIETY.

A paper on this subject, by Mr. Arthur Oates, of Bradford, was read at the last meeting of the Society.

The author opened his subject by referring to the probable exhaustion of the coal supply, and advocated the substitution of the tides as a producer of motion. Although it may not be until the distant future that advantage is taken of the power of the tides, yet, in his opinion, owing to its inexhaustible character, it will ultimately outrival all other sources of mechanical power. He then described the most favourable sites for taking advantage of the tides economically, stating that there were many places on our coasts where the tides could be utilised at a sufficiently low cost to enable them to compete with coal.

The ways of taking advantage of the power of the tides he divided into two comprehensive classes,—one requiring large permanent constructions, such as the various modifications of the tidal dam,—this he considered the most efficient and economical for using the vertical motions of the tides, which motion is the most important for mechanical purposes. The other class was the numerous but comparatively unimportant utilisers which do not require such works, such as the tidal cask, but which would only be employed when the power is required intermittently.

The former could only be undertaken by large public bodies, but the latter might be employed by small capitalists. He then suggested how the horizontal motion of the tides might be taken advantage of by water-wheels, &c. After pointing out that the ways of utilising the tides were innumerable, and describing the construction of the tidal dam, with suitable converters of the power, such as turbines in openings of the dam, working air-compressing or magneto-electric machines, he stated that the necessity for large conservators for storing the power between the tides would be the greatest difficulty in utilising their power. A brief description of how this could be done, and the power rendered constant, was given.

The means of conveying the power to a distance was then considered,—air and water pressure and electricity being suggested. With regard to the latter, he believed the age of steam had reached its zenith, and the "age of electricity" had dawned. But should there be difficulty in conveying the power to a distance, he suggested that manufacturing towns should be built adjacent to suitable sites for utilising the tides.

In conclusion, the author pointed out that the estuary of the River Mersey possessed many advantages as a tide-utilising inlet, both from its natural features and the great vertical range of tide. By the construction of a dam at its narrowest part, an area of thirty square miles would be enclosed, and an easy means of communication obtained between Liverpool and Birkenhead which would obviate the necessity of a subway, as proposed.

MODERN WOOD-CARVING.

The two tables of which we have engraved representations were executed by Mr. Rogers, of Maddox-street. They are very different in character. The first is of the Queen Anne period, and intended as the Communion-table for the private chapel in Aldenham House, Elstree, the seat of Mr. Henry Hucks Gibbs. Mr. Rogers has lately bestowed much of his time on the decoration, with works of wood-carving, of this mansion. Amongst other works, he has finished five elaborately-carved chimney-pieces, under the auspices of the architect, Mr. Ed. Ellis.

The other table is of Arabic design, and executed in ebony and gold, with a rich Oriental jasper top, of great rarity. The designer has caught the peculiar character of this Oriental style. Round the frieze is carved, in raised Arabic letters, that portion of the Koran which is known as the "Chapter of the Table."

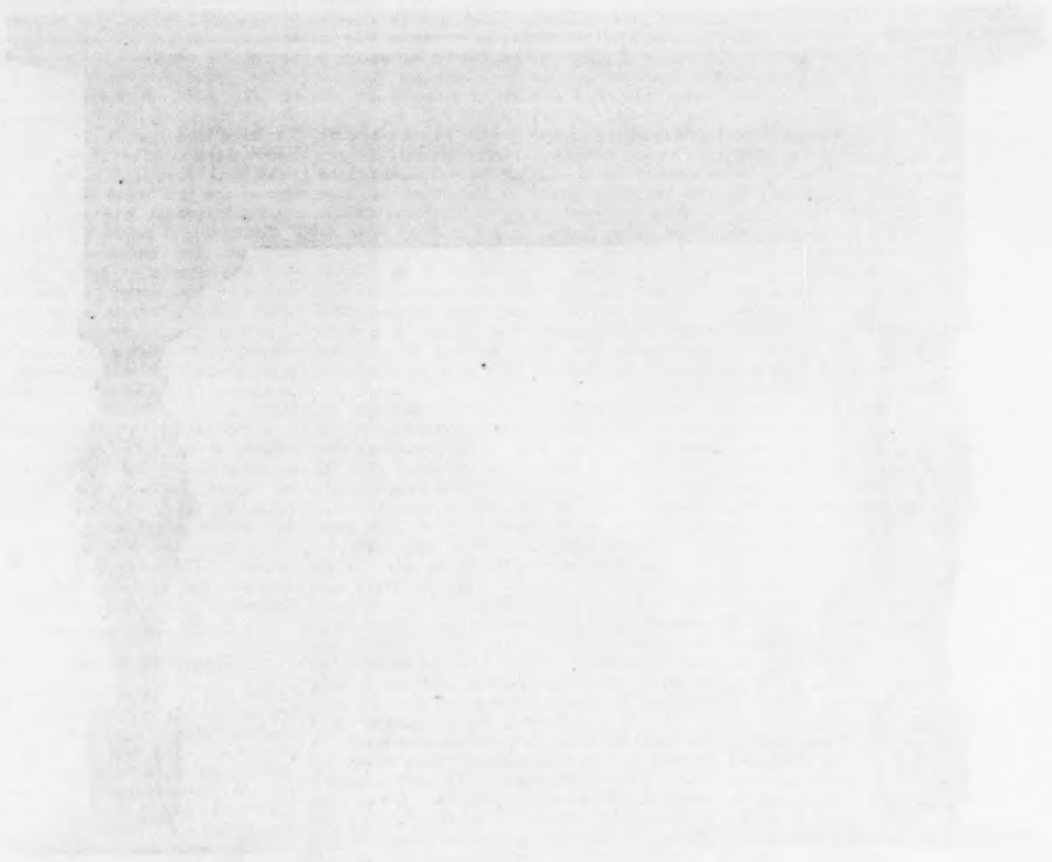
CHOIR STALLS OF THE CHURCH OF NUESTRA SEÑORA DEL PILAR, SARAGOSSA.

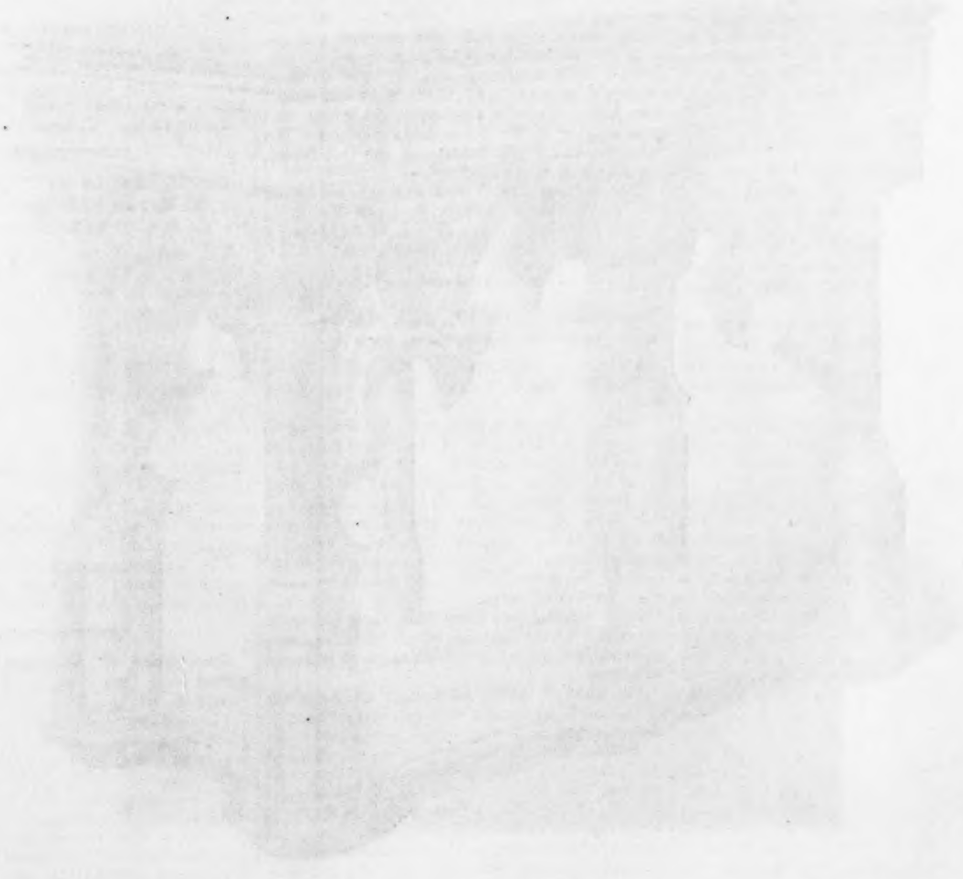
The elaborate choir-stalls of the Church of Our Lady at Saragossa, of which we give an illustration in this issue, were commenced in 1542, and completed at a cost of 62,000 Aragon sueldos, according to Spanish authorities. The work was executed by Juan Moreto (of Florence), Nicolas Lobato, and Estéban de Obray, in accordance with designs prepared by the latter master.

The seats, of which there are altogether 115, are in three rows, and are entirely in oak. It is impossible to describe in detail the remarkable elaboration which they exhibit: colonnettes, panels enriched with figure-subjects, brackets, arms of the seats, misereres, and cornices, all carved or inlaid.

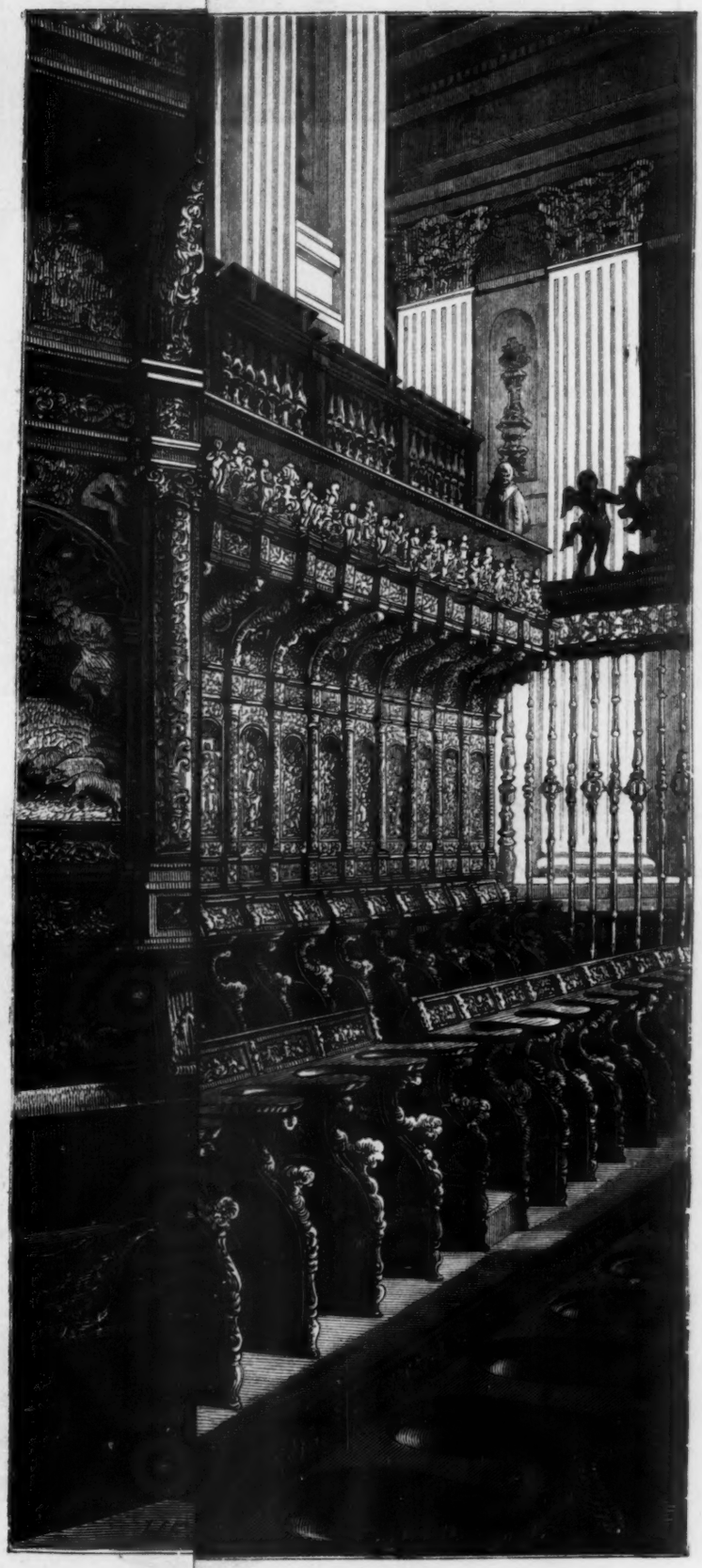
The beautiful bronze railings which enclose the choir were completed in 1579 by Juan Tomás Celma, at a cost of 23,000 sueldos.

Curiosities of Numbering in Oxford-street.—At the meeting of the Marylebone Vestry on the 11th inst., a letter was read from the Postmaster-General, calling attention to the great inconvenience caused in the numbering of houses in Oxford-street, thereby hindering the prompt delivery of letters. There are, it appears, eight houses numbered 315, eight numbered 314, three called 343, and two numbered 256; while 140 houses have only 55 numbers among them. The chairman said the numbering of this street was something frightful. An immense number of leases would fall in in 1882, so that, perhaps, action at present might be thought inopportune. Mr. Brook said that if the Vestry waited till the rebuilding of houses ceased in Oxford-street, they might wait till domesday. The letter was referred to the Works Committee.

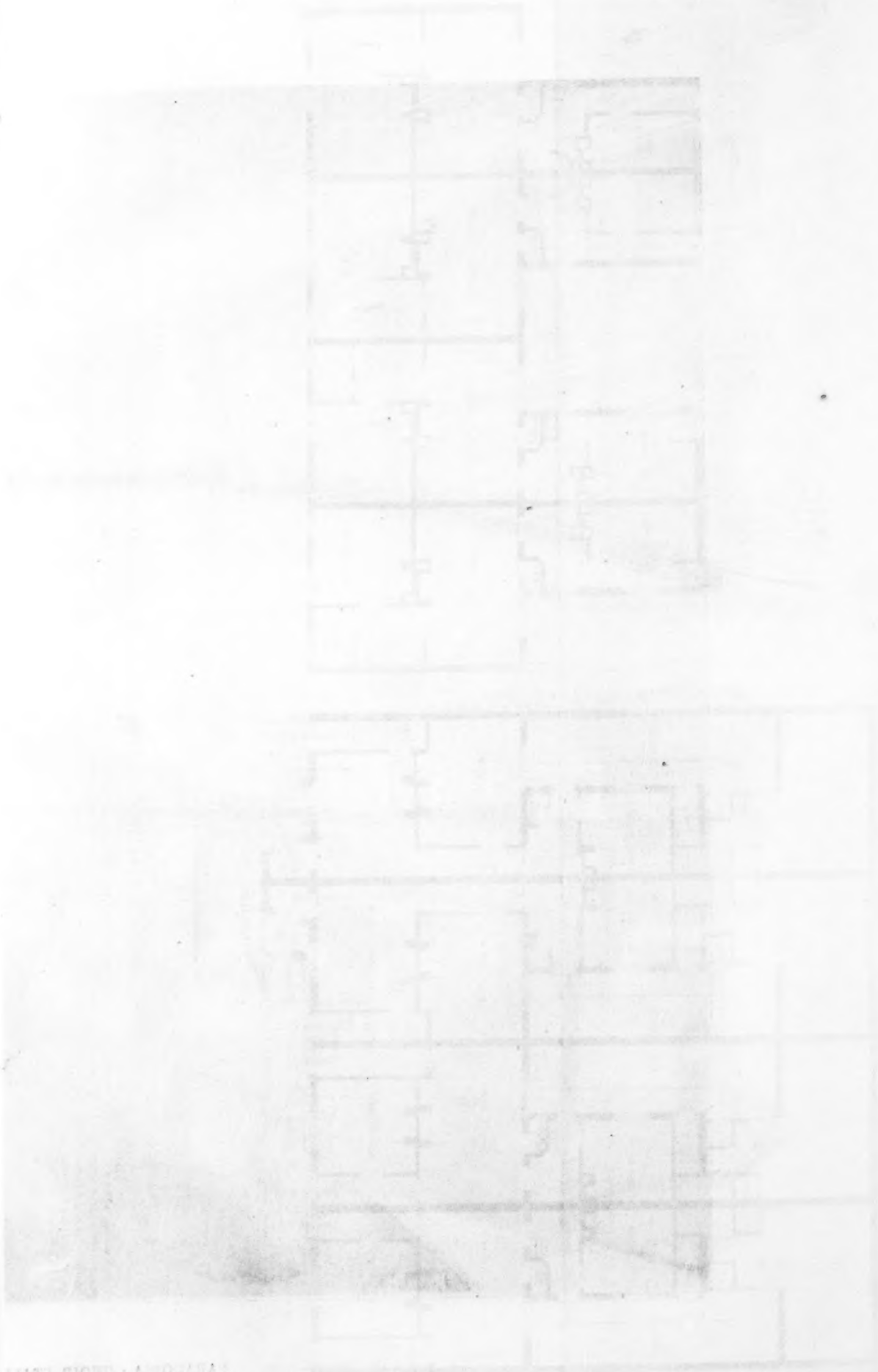


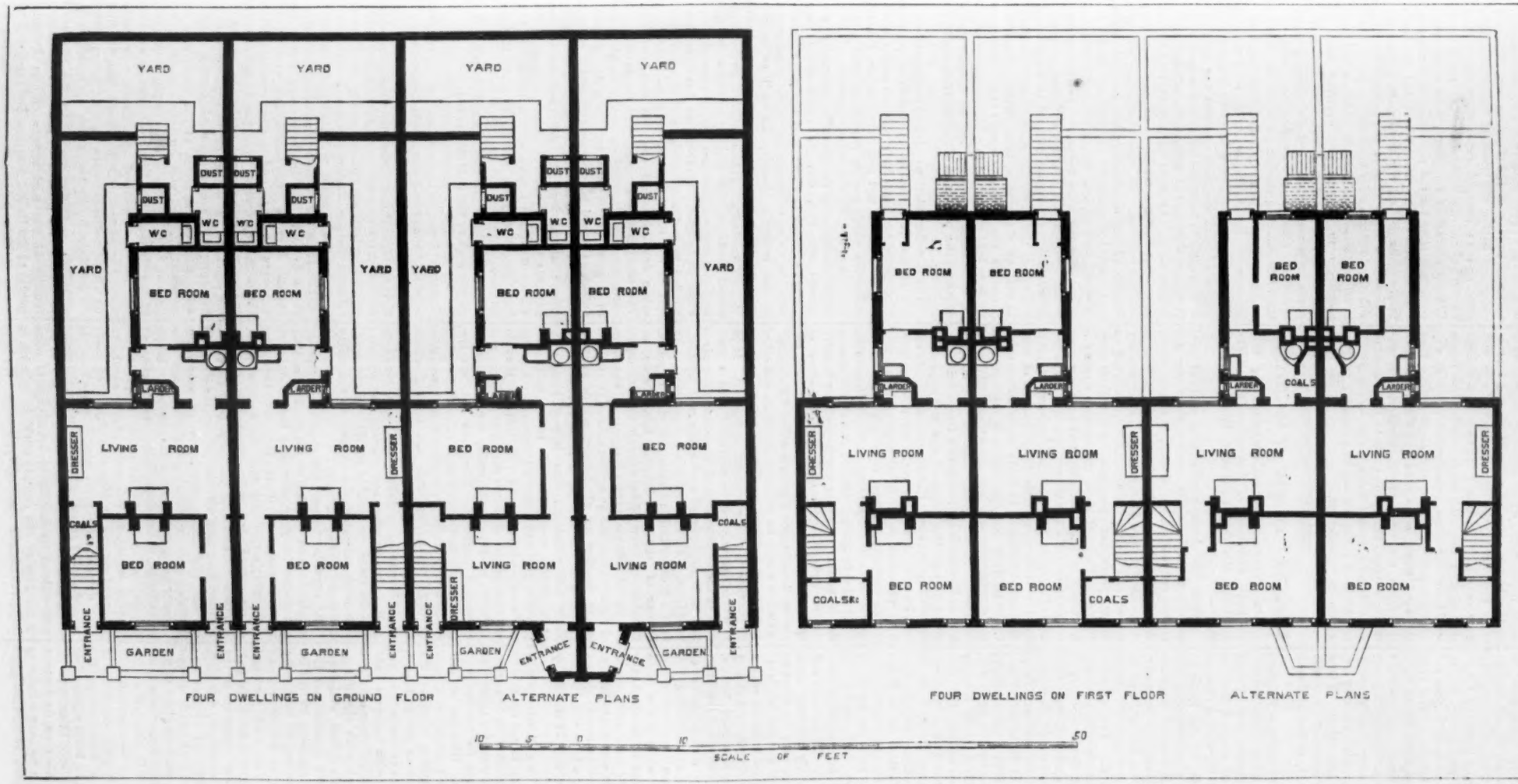


MODERN WOOD-CARVING.—Two Tables by Mr. G. A. Rogers.



SARAGOSSA : CHOIR STALLS OF THE CHURCH OF NUESTRA SEÑORA DEL PILAR.





SEPARATE DWELLINGS *v.* LODGINGS FOR ARTISANS AND LABOURERS.

The question of overcrowding among the poorer classes, the evils of which we have continuously pointed out, has now for some time received a large amount of public attention. Many societies and companies have been formed for the express purpose of providing healthy and convenient homes for artisans and others whose limited means compel them to make the outlay for rent as small as possible. A negative good has been secured in some instances by the aid of Parliament in clearing away parts of those over-crowded slums which disgrace modern civilisation, and, so far as the great centres of population are concerned, an attempt to solve the question of rebuilding has been made by the erection of large blocks of dwellings in flats. Whether the best mode of building in flats has yet been carried out we will not here consider. The price of land in the centre of large towns renders it almost imperative to build in flats, if artisans' dwellings are to be provided at all in such situations. These blocks of dwellings, however, only deal with a small part of the question. Like other classes, the poorer people have been forced to migrate to the outskirts of the town, and we fear that, in many of the nearer suburbs of London, where street after street of six and eight roomed houses has been erected, overcrowding is not unknown.

With the exception of Kensington and one or two other districts of very limited area, London is now surrounded by a wilderness of small houses of from six to eight rooms, each house being constructed for the convenience of one family. In these houses, whose number is legion, and which are fearfully and wonderfully alike, the great bulk of the artisans, clerks, and warehousemen of the metropolis reside. Any one who has the slightest knowledge of the home-life of these particular classes must be aware of the fact that the rents charged for these small

houses in the suburban districts of London are such as to make it absolutely impossible, in most cases, for artisans, clerks, or warehousemen, to occupy them without sub-letting. The exigencies of the case compel them to let to their own class, and in all probability, in the large majority of cases, these small houses are occupied by two separate families. The very arrangement of such houses, split up as they are into six or eight little rooms, suggests the opportunity of overcrowding. Bedrooms are used as kitchens, and the privacy of each family is at all times liable to be intruded upon by the in-coming or out-going of the other. These facts seem to show that the wants of the wage-classes have not yet been met, so far as dwellings are concerned.

There is no doubt that the average Englishman likes to feel that "his house is his castle," and prefers to have a separate and distinct house; therefore we may rest assured that he does not consent to share it with a strange family until driven to do so by the force of circumstances. That the circumstances are against him in this respect is evident from the experience of the Artisans' Dwellings Company, who, by stringent regulations, endeavoured to prevent sub-letting on their estates at Battersea and Queen's Park, Kilburn. The attempt utterly failed, and at the present time not only is sub-letting permitted, but in the majority of the houses there are two families living. The smallest houses built by the Artisans' Dwellings Company consist of four rooms and a scullery. On the ground-floor:—One, 11 ft. by 9 ft. 7 in.; one, 11 ft. 3 in. by 11 ft. 3 in.; and scullery, 8 ft. by 7 ft. On the first floor:—One, 11 ft. 3 in. by 11 ft. 3 in.; and the other, 14 ft. 3 in. by 9 ft. 7 in. The largest houses built by the company consist of seven rooms and a scullery. On the ground-floor:—Parlour, 12 ft. 9 in. by 11 ft. 1 in., with bay window; living-room, 12 ft. by 11 ft.; kitchen, 9 ft. 6 in. by 9 ft.; and scullery, 8 ft. by 6 ft. On the first-floor:—One, 16 ft. 3 in. by 11 ft. 1 in.; one, 12 ft. by 11 ft.; one, 9 ft. 6 in. by 9 ft.; and one, 9 ft. by 6 ft. These are called by the company fourth and first class houses respectively. The second and third class houses vary slightly between these two. Altogether, the houses may be taken as fairly representative of the several kinds of small houses which have been built to such a large extent round London during the last twenty years. With regard to the first-class houses, they appear to be admirably adapted for overcrowding. The unnecessary multiplication of rooms is found to encourage overcrowding. A large living-room and kitchen combined would be preserved to one family, while if the same were cut into two and divided under the heads of living-room and kitchen, each room would too often be made to contain a separate family. Sub-letting ought decidedly to be at a minimum in the fourth-class houses, where the largest room on the ground-floor is only 11 ft. 3 in. by 11 ft. 3 in.

Mr. Mark H. Judge, who is a director of the Artisans' Dwellings Company, is not of opinion that the houses now being erected by the company are the best possible houses for those who will have to occupy them, and he has designed some which he thinks better. His plans we now publish. These buildings consist of three-roomed dwellings, one dwelling being on the ground floor, and the other on the first-floor. Each dwelling has a separate entrance from the street, a separate scullery, with separate yard and offices. The plans we publish show alternate arrangements. Taking that with the living-room in the front on the ground floor, we have a dwelling on the ground floor consisting of the following rooms:—One living-room, 13 ft. 4 in. by 10 ft. 9 in.; two bedrooms, 13 ft. 6 in. by 10 ft. 9 in., and 9 ft. 9 in. by 8 ft. 9 in.; and scullery, 9 ft. 9 in. by 5 ft. 6 in., with yard and offices. Over this there is a distinct and perfectly private (as far as the occupants of the ground-floor dwelling are concerned) dwelling, with living-room, 16 ft. 9 in. by 10 ft. 9 in.; two bedrooms, 13 ft. 4 in. by 10 ft. 9 in., and 11 ft. 6 in. by 5 ft. 9 in., with scullery about 7 ft. by 6 ft. A flight of stone steps leads down to a yard with offices, which is situated at the back of that belonging to the ground-floor dwelling. A house on this plan, and rooms of the dimensions given above, would occupy the same area as that required to build a first-class house of the Artisans' Dwellings Company. If two families are to live on this area, no doubt it would be to their advantage to have a building constructed on some such plan as that designed by Mr. Judge. Such a dwelling, with its fair-sized living-room, would certainly be preferred by the better class of artisans to the fourth-class house with the front room on the ground floor only 11 ft. by 9 ft. 7 in., and he considers that double the rent of a fourth-class house would be the least commercial value of the double-tenement house, and consequently that the rent would more than pay for the cost of the extra staircase, street-entrance, kitchen-range, copper, sink, &c., even to the extent of allowing for fireproof floors, which, as the Building Act now stands, would be called for on sites within its jurisdiction.

AMERICAN INSTITUTE OF ARCHITECTS.

The thirteenth annual convention of this Institute was held in November last. The president, Mr. Thos. U. Walter, in his address, said:—

There has been considerable architectural activity throughout the country since our last annual convention. It should, however, be remarked that but few buildings having claims to magnificence have been projected, though many grand and costly structures, commenced in former years, have progressed with satisfactory results. Works of more recent date exhibit a freshness in their architectural handling that seems to indicate the advent of a new era in the arts of design. The manifest tendency of architects to break away from the trammels of conventional rules, and to make style subservient to the spirit of the age, indicates a progress in the development of independent thought hitherto unknown. Architecture, both in this country and in Europe, is obviously in a transition state. What may be the result of this new departure remains to be seen. If, however, architects are careful to design their works on true æsthetic principles, and in conformity with the sciences which underlie our art, it is not likely to be regretted that they show a disposition to do their own thinking. Classic forms and classic combinations are everywhere yielding to more ornate compositions, bearing the names of Queen Anne, the Stuarts, the Jacobean, the Italian Renaissance, the style called "Eastlake," which it would be difficult to define, and other fashions of building having no trace whatever of paternity, either ancient or modern. It is, however, greatly to be regretted that a good deal of the architecture of the present day gives but little evidence of conformity with æsthetic principles. We find modern compositions, both in this country and in England, having a decided flavour of the old English Renaissance, or Elizabethan, type of building, but which manifests a lamentable want of vigour in the form of their masses, and an aggregation of trivialities in the making up of details, which awaken emotions in the cultivated mind that are anything but pleasing. The largest licence in architectural composition is undoubtedly admissible, provided it does not degenerate into the production of forms and combinations that do violence to the elements of fitness, beauty, and stability, which, in all cases, are essential to successful building. The first involves the planning of our works so as to fulfil the requirements and promote the comfort and convenience of our employers; while the second, which embraces, in the fullest extent, the philosophy of architectural propriety and taste, tends to results that ennoble and elevate our science; and the third, comprising stability of construction in all its ramifications, insures the safety and durability of our work.

As regards the peculiar claims of domestic architecture on the skill of the profession, they are undoubtedly greater than they have ever been before; and it is only by becoming thoroughly acquainted with the increasing requirements of the age, in reference to buildings intended for domestic purposes, that an architect can keep pace with the progressive elements of his profession. Improved processes for warming and ventilating buildings are continually being developed, and questions relating to drainage, to the disposition of sewer gas, and to other sanitary appliances that are now profoundly occupying scientific minds, should be regarded by the architect as objects of study that demand the most serious attention. It should also be remarked that the requirements of modern civilisation and taste are not to be met without an intelligent knowledge of what is going on in the outside world in relation to improvements in building appliances. We have now a thousand-and-one inventions which furnish us with every conceivable object of usefulness and beauty in the building art, of better design, of better materials, of better workmanship, and at cheaper rates than were ever known before. It is, therefore, to our interest to keep abreast of the times, so as to utilise all modern devices for the perfection of our works.

In relation to the present status of the Institute, and its outlook for the future, I have the satisfaction to say that it is evidently exerting a decided influence for good on the public mind in all matters pertaining to our art, and that architects in general are deriving from it, directly or indirectly, advantages that never could have been realised if the profession had remained without a corporate existence. It therefore becomes our duty to seek to enlarge our field of usefulness by increasing the membership of the Institute until it embraces respectable practitioners in every considerable centre of civilisation throughout the country. It is greatly to be regretted that a large number of respectable, and in many cases distinguished, architects in our most important cities have never yet become members of the Institute; while it is known full well that many who are outside of our organisation are not inferior in professional standing to any who are within it. It would be well, and in no small degree courteous, if steps were taken, by making exceptional modifications in our terms and processes of admission, to receive all such into the membership of the Institute upon their expressing, in writing, a desire to that effect. Whatever promotes the consolidation of the profession tends to lead the public to a higher appreciation of architectural genius, and to inspire confidence in the principles which govern scientific building.

The peculiar relations of architecture to civil life render it desirable to institute popular educational processes by which the public mind may be reached and instructed in the general principles which govern fitness, propriety, and good taste in architectural composition. Unlike other professions, architecture primarily addresses the eye, and its developments are always exposed to view; it is therefore incumbent on us to enlighten the public in reference to its æsthetic elements as well as to the sciences which underlie its practice, and to its historic relations. This may be done by illustrated lectures, by popular articles in our architectural publications, and in scientific and other periodicals. This subject has often been alluded to in the proceedings of the Institute, and in the chapters, but we have never yet taken any concerted steps in this direction. The architectural training pursued in many of our educational institutions is important, as far as it goes, but it fails to reach the general public. I would therefore suggest that regular courses of public lectures on architecture, with proper illustrations, be delivered under the auspices of the several chapters during the winter months by such of the fellows of the Institute as may be willing to perform that service.

The *American Architect*, which reports the proceedings at the convention, says:—

"An order was passed, giving the Board of Trustees power, on the recommendation of their report, to waive the proscribed formalities (not the conditions) of membership, and elect fellows directly at their discretion from among qualified architects; a proposition to form a new grade of non-professional life-members, which was referred to the Trustees; and a resolution directing the Trustees to consider the question of dissolving the present chapter organization, so as to leave the Institute, as it was in its earlier days, a body consisting entirely of members at large, and if, after consulting the chapters, they decided in favour of the change, to report the necessary alterations in the law of the Institute for action at its next convention. This proposition was the outcome of a recommendation in the report of the committee on membership, and was directly suggested, we believe, by symptoms of disaffection on the part of the Chicago and Cincinnati chapters, which had failed to convert the Institute to some desired legislation; the Cincinnati chapter, with no fear of coercion before its eyes, having sealed its devotion to its lost cause by a deliberate secession. A special committee was appointed to collect and present to the next convention records of the architecture of the Colonial period of the United States and of the first fifty years of their independence, and another for

'the consideration of the best solution of the tenement-house problem, especially as it is presented in the city of New York.'"

NEW BUILDINGS IN PARLIAMENT STREET.

ALMOST immediately opposite to the new Home and Colonial Offices in Parliament-street, a prominent block of buildings is in course of erection for Messrs. Waterlow. The buildings, which are in close contiguity to the Whitehall Club, have a frontage to Parliament-street 35 feet in width, and are carried to a height of 66 feet. They are of considerable depth, and will ultimately be carried to Cannon-row, a depth of 90 feet, with a frontage to the last-named thoroughfare, and also a third frontage opposite the side elevation of the Whitehall Club. They contain, including the attic, four stories above the ground-floor, which consists of two shops. The Parliament-street frontage is of Portland stone, with some carving and ornamentation introduced. The ground-floor portion of the elevation is rusticated, and immediately above the shops, at the foot of the first floor, there is a projecting stone balcony, resting on cantilevers, faced with sculptured female figures. Each of the upper floors contains a range of six windows. The piers between the first-floor windows are carved, with suspended fruits and flowers. At the foot of the first-floor windows a balconnette is carried across the face of the elevation. The whole of the building, which contains a ground area of about 2,700 ft., is intended to be occupied by Messrs. Waterlow in connexion with their business.

The architect of the building is Mr. Hall, of Moorgate-street; and the contractor is Mr. Brass, of Old-street. Mr. Hobbs is clerk of the works.

ARCHITECTURE AND PUBLIC IMPROVEMENTS.*

IN recalling the leading events of the past year in the world of architecture and building, one is irresistibly reminded of the question so often discussed by critics,—artistic, architectural, and literary,—as to the real definition of architecture, and the reasonableness of the somewhat arbitrary boundary by which it is separated from engineering. For, if we consider what is the most remarkable building event of the year, unquestionably we must conclude that 1879 will be memorable in the history of such events mainly, as far as this country is concerned, for the commencement of the new Eddystone Lighthouse. The fame of the older structure was so justly great, its name has become so proverbial as one of the most brilliant achievements of English engineering genius, under exceptional difficulties, and the new work promises to be so worthy a successor to the old, that it seems impossible, in speaking nominally of architecture, to put any other building enterprise of the year before this. It is something to be remembered with pride by the countrymen of Smeaton that the edifice which he erected has had to be superseded mainly through the defects of the natural rock on which it was founded, rather than through any weakness in the structure itself; and that the engineering science of the present day, with all its acquired experience, has hardly pretended an ability to make any improvement on the lines and general design of Smeaton's lighthouse, though some practical improvements on the process of construction are being realised. The new lighthouse is much larger than the old one; Smeaton's building had a base of 32 ft. diameter, and carried its light at a height of 72 ft.; the new erection, designed by Mr. J. W. Douglass, has a base of 44 ft., and carries its light at the height of 130 ft. Smeaton's lighthouse was built internally of Portland stone, faced externally with granite blocks shaped from the exceedingly hard rounded granite fragments found on the face of the country in Dartmoor and other similar districts, and called hence "moorstone." The new work is built entirely of granite, with special methods to ensure permanence; the stones in the basement especially being let into each other with a dovetailed projection fitting into a channel in the adjoining stone, both on the side and end, and additionally secured by bolts of a metal specially compounded for the purpose, as having the greatest power to resist oxidation and other chemical deterioration; and the whole, when put together in Portland cement, will probably furnish, as its engineer says, a structure "stronger than the rock itself." The Eddystone Lighthouse has an additional interest in connexion with English building of every kind, as it was owing to the experiments made by Smeaton in order to discover the best cementing agent for his work, that we were first put on the right track in regard to the qualities and power of what is now known as Portland cement, a material which, though long confined to use in engineering work, is likely to become an important ingredient in much of architectural work, as the basis of concrete; a material which is becoming more and more talked about, and already put into use in various forms, as a substitute for brick walling, in which capacity the economical advantages which it offers may even influence architectural decoration by leaving a margin for the introduction of ornament where it would otherwise have been impossible to indulge in anything but plain walls.

If we have to congratulate ourselves on the commencement of one great engineering work, we have also to rejoice over the preservation of another, which combines some of the highest qualities both of architecture and engineering. The additions which had been proposed, and were nearly being carried out, to increase the traffic accommodation on London Bridge, would have involved not only possible injury to the stability of the structure, but certain and absolute disfigurement to what may truly be called one of the noblest architectural works which London possesses; for London Bridge has exactly the qualities which constitute the highest architectural character and expression,—solidity and mass, perfect execution, and a complete suitability of the design to its practical purpose. The proposal to destroy the grand monumental character of this structure by tacking balconies on to it for pedestrians, is a painful example of the indifference which is felt in modern England towards architectural grandeur, when it is supposed to stand in the way of any fancied "practical" advantage; and it is matter for sincere congratulation in the eyes of all those to whom architecture, in its noblest and severest forms, is of any consequence at all, that the House of Lords, by throwing out the Bill of the City corporation for widening the bridge in the manner proposed, have preserved us from the discredit of having deliberately spoiled and disfigured one of our grandest structures, and that the greatest ornament of the Thames is still left intact.

If there be any question raised as to the suitability of including the two engineering works just named under the head of "Architecture," no better justification for it could be found than in the writings and the career of the greatest mind among contemporary architects, whom we have had the misfortune to lose during the past year. Though Eugène Emmanuel Viollet-le-Duc was not an Englishman, his loss is ours as well as that of his countrymen; for, in fact, he belonged not to France but to all Europe. And the whole tendency of Viollet-le-Duc's teaching and practice was in opposition to the academic theory of architecture, which regards the art as merely the application to buildings of certain derived ornamental or decorative features. With Viollet-le-Duc every kind of building, whether it was a mansion, a bridge, or a fortification, was equally "architecture," for, with him, architecture simply meant the best, most scientific, and most expressive form of building. His whole professional life was, in regard to this, more or less of a fight against the Academic party in France, and the system of Government instruction as carried on at the École des Beaux Arts. Of his work in other ways much is already becoming well known in England. His great "Dictionnaire Raisonné de l'Architecture," itself nearly sufficient, as one might suppose, to be the work of a lifetime, is now a necessary element in every good architectural library, and is probably the finest work in illustration of architecture that has ever been published, when we regard the mass of detailed information it contains, the insight into the relations of architecture to the history and social economy of nations, and the admirable and hitherto (in such a work) unequalled character of the illustrations. Yet this great work, though constituting his chief monument, is but a part even of his literary labours. Among his many other critical and illustrative books in relation to his favourite study may be mentioned his "Dictionnaire du Mobilier"; his admirable "Lectures on Architecture," two volumes of which have already been translated into English, and which contain some of the most profoundly suggestive criticisms in regard to the very foundation of art and of artistic perception; his "History of a Fortress," in which the most minute information in regard to the successive stages of military architecture is conveyed in a manner which has all the interest of a romance; his "Essai sur l'Architecture Militaire;" and his "History of a House," in which the philosophy of house architecture, practical and æsthetic, is brought into so simple and readable a form as to be clear to every comprehension, and which, it may be added, was written merely as an evening's amusement while making a survey for the French Government in an out-of-the-way district. His practical work included the restoration of some of the most interesting and historic buildings of France, among which may be mentioned Notre Dame at Paris, and the Abbey Church of St. Denis; and subsequently, he restored the fortifications of Carcassonne, the Cathedrals of Laon and Amiens, Notre Dame de Chalons-sur-Marne, and the Château of Pierrefonds; the last-named building being one of the finest and most interesting of the Mediæval châteaux of France, in which Viollet-le-Duc took especial interest, and arrived at nothing less than the production for modern spectators of a complete reconstitution of the feudal dwelling in the days of its greatest splendour,—a task which his unequalled knowledge of French Mediæval architecture and furniture enabled him to accomplish as probably no one else of his time could. Subsequently he was intrusted with the supervision of the works for the additional fortification of Paris under the Republic, thus vindicating in his own person his theory as to the unity of all classes of building and construction under the general head of architecture. His knowledge seemed to be almost encyclopædic; and one of the men who worked under him was heard to say of him, "He knows everything, from geology to cookery, and it all comes like music from his lips." The last scheme in which he had interested himself was the effort to bring about the foundation of an opera-house for the people, in order to bring the lyric drama within the reach of all. With all this varied ability and power, he was a man of the most simple and unassuming character, working hard early and late in his favourite craft; ready to impart his knowledge to all who sought it, and beloved and respected by all who had dealings with him; such a man as the architectural world will not, it is to be feared, see the like of again for some time to come.

The great historic Abbey Church of St. Albans has continued during this year to be the subject of hot discussion in regard to the treatment of the building by those under whose care it is for the time officially placed. Last year the walls of the structure were lifted into the perpendicular from which they had dangerously declined, a proceeding about the advantage of which there could be no difference of opinion; but dire was the outcry when it became known that the Restoration Committee intended to place a new roof on the nave, and sensible people could derive little satisfaction either way from a contest in which both sides were more or less wrong, and seemed influenced less by interest in a great building than by a wish to annoy their opponents. The Society for the Protection of Ancient Buildings, whose members seem to be actuated rather by sentiment than by any knowledge of facts, declared that the existing roof was perfectly good, which they had no means of knowing even if it had been the case; the Restoration Committee decided, quite rightly and on sufficient advice, that the roof was in such a condition that a new one was indispensable; but they then unfortunately adopted a theory that it was their duty to replace the low-pitched roof by a high-pitched one, such as would very likely have been first placed on the building when the walls were erected, but of the former existence of which there was no trace and no proof. They have, it is to be regretted, carried their point, and have thus altered the proportion and the outline of a building which has been for centuries a part of the landscape in which it stands, and breaking through all the sentiment and the associations of the place for an object even the architectural value of which is exceedingly doubtful. The moral connected with the matter is that if the mass of the public interested themselves more in such subjects, and were not so deplorably ignorant and indifferent on the subject of archi-

* From the "Companion to the Almanac for 1880." The Company of Stationers, Ludgate-hill.

tecture, both ancient and modern, there would be a healthy public opinion which might prevent the indulgence of sentimentalities and mistakes such as these; but the public and the press, as a rule, neither knowing nor caring anything about such things, the treatment of buildings which form a part of the history of the nation is thus left to the pleasure of a few irresponsible persons, who may do an entirely irreparable injury to it, the extent of which will only be recognised when it is too late.

It is important that every opportunity, therefore, should be taken of endeavouring to promote increased interest in such subjects in the minds of those who are not specially or professedly concerned in architecture and archæology, and who may therefore exercise in such matters what may be called the judgment of common sense, uninfluenced by professional feeling or archæological sentiment, which latter quality is not infrequently displayed in a somewhat unreasonable manner, and without sufficient consideration for the practical wants of the present day. There is likely to be increased necessity for the exercise of public criticism in regard to the ancient buildings of London, as the necessity for the improvements in thoroughfare accommodation, and the changing demands of commerce, lead inevitably to the removal of such old buildings as are manifestly useless to the modern community, and occupy ground the commercial value of which is enormous. This subject comes, in fact, into the history of the architectural movement of the year, as the question of the treatment of some of the City churches has been much agitated, and is likely to become an increasing source of contention between archæologists and men of business. The *Builder*, in view of this discussion, republished in its issue for the 3rd of May a former engraving representing "the threatened churches of London," which included some of the best and most characteristic of the works of Wren. Some of these it will probably be impossible ultimately to save, except at the cost of absolute neglect of important present interests; but while there is no doubt that those who are most strongly interested in these buildings are apt entirely to overlook the claims of existing society, it must, on the other hand, be plainly said that the tone and spirit in which such works are regarded by the commercial or City mind exhibits an indifference to the picturesque and historic interest of these old buildings, and a preference for £. s. d. over every other consideration, which is deplorable. A more general and enlightened public interest in the question would be the best check on archæological sentimentalism, on the one hand, and commercial indifference on the other hand; and each of our readers may do something to promote such a balance of public criticism when the time comes for exercising it.

Reference to the works of Wren naturally brings to mind the fact that some special interest has been excited during the present year in connexion with his greatest work, the Metropolitan Cathedral, which is, fortunately, under the charge of an architectural custodian (Mr. Penrose, "the surveyor to the fabric"), who combines, in a rare degree, archæological enthusiasm with practical knowledge and judgment. Investigations carried on under his direction have led to the discovery of a portion of the foundations of the cloister and chapter-house of the Mediæval cathedral which perished in the Great Fire, and these remains have seemed to point, among other things, to the interesting fact that the choir of the old cathedral was deflected from the line of axis of the nave, inclining towards the north-east, in the manner which is found in several Mediæval cathedrals and churches, and which is believed to have had symbolical reference to the inclination of the head of the Saviour in Mediæval representations of the Crucifixion. What is, however, of much more direct and certain historical interest to us is the discovery, by Mr. Penrose, of the foundations of St. Paul's Cross,—an erection which was connected with so much of the political and social history of England, in one of its most stirring and eventful periods, and the site of which must be matter of such interesting associations to every Englishman. Both the pavement of the old cathedral and the base of the cross were considerably below the present ground-level of St. Paul's Churchyard (illustrating the constant tendency to a raising of the ground-level in large cities, owing to the accumulation of *débris*), and though the actual remains of the structure could not be permanently exposed to view without fear of their disintegration by weather, as well as inconvenient interference with the ground-level, the site of the cross is now marked on the land at the north-east angle of the cathedral, which has also been laid out and planted as a small garden, open to the public, thus greatly improving the appearance and accessories of the building from this point of view, and giving a new historic interest to the locality. The crypt of the cathedral has also been cleared from the lumber and dust of generations, and thrown open to the public; the eastern portion, on the site of the ancient chapel of St. Faith, arranged as a small church for daily early morning service, and some of the old monuments rescued from the original cathedral have been arranged here. These and other interesting details were communicated by Mr. Penrose, early in the year, to a meeting of the Institute of Architects, in a paper which will be found in their Transactions; not, however, including the particulars about the remains of St. Paul's Cross, which were not discovered till a few months later.

One of the most interesting new architectural schemes of the year has been that which has resulted from the determination of the Trustees of the City of London School to yield at last to the pressure of circumstances, and remove their important establishment from the narrow and cramped site on which it has so long stood, to a new building on a roomy and airy situation on the Thames Embankment. This resolution led to an architectural competition, in which, as in so many similar cases, a great amount of admirable work was thrown away, and an exceptional amount of practical and artistic talent exhibited. The committee appointed to consider the designs went into the subject with unusual minuteness, and have selected a design which we must conclude affords them the accommodation they look for in what they regard as the best and most convenient manner. Unfortunately, however, they cannot be congratulated on having chosen a design which architecturally will be likely to be considered worthy of the site; and though this is a secondary consideration in comparison with suitability of plan, it is certainly matter for much regret that there seems little probability of the Thames Embankment, the river frontage of which affords such a splendid site for the noblest architecture, being occupied by buildings really worthy of the situation. The architectural history of this great thoroughfare, so far, is not encouraging. It has been occupied at one end by a hotel of the most commonplace description architecturally, at the other end by a half-finished building, the proposed, but now abandoned,* opera-house, which, had it ever been completed, would have been no ornament to the site, and totally unworthy to stand under the shadow of Barry's Clock Tower; and now we have the promise of another large building, which will permanently occupy a considerable portion of the frontage with architecture as good as anything else that is there, but apparently not much better. It is to be hoped that future efforts at the architectural embellishment of the Embankment will lead to more fortunate results than this promises. The building is not, indeed, commenced yet, but it is understood that the selection of the design is finally determined on, and as the designs submitted were open for public inspection, it was possible to judge both of what was done and of what might have been done."

Civil and Mechanical Engineers' Society. The following is the programme of papers to be read before this Society during Session 1879–80:—Dec. 18, 1879, opening address by the president, Mr. W. C. Street; January 8 and 22, 1880, "The Bridges of the Thames at London," by Mr. A. T. Walmisley; Feb. 5, "Corn Mills," by Mr. H. Ellis Hill; Feb. 19, "The Fracture of Cast Iron," by Mr. James Love; March 4, "The Beneficial Action of Mind on Matter," by Mr. R. Harkness Twigg; March 18, "A Railway to India," by Mr. B. Haughton; April 8, "Teredo and other Insects destructive to Wood in Marine Works," by Mr. Thomas Cole; April 22, "Roof Construction in the Middle Ages," by Mr. Charles H. Rew; May 6, "A Small Colliery in North Wales," by Mr. W. F. Butler; and May 20, "Cement Manufacture," by Mr. C. H. Driver. The annual meeting will be held on the 3rd of June.

* It is now stated that definite arrangements have been made for completing this building.—Ed. B.

THE IMPERIAL DOCKYARD, DANZIG.

To the two important dockyards which the German Empire already possesses,—one at Kiel, in the Baltic, the other at Wilhelmshaven, opening into the German Ocean,—a third will shortly be added. The works at the imperial dockyard at Danzig have now progressed so far as to warrant the expectation of the docks being opened in the spring of the coming year. The dockyard comprises an iron floating-dock, the dock-basin, and three radial slips in connexion with the latter. The floating-dock has a length of 325 ft. in the centre line, and a breadth of 112 ft., by a height of 48 ft. 6 in., of which 12 ft. 6 in. are absorbed by the pontoon. At its completion, it will be permanently stationed in the Vistula, by the side of the dock-gate. On docking a ship, the dock is towed to a deeper part of the river and partly immersed by filling fifty of its sixty-five water-tight compartments. The vessel to be docked is then hauled into the floating-dock, anchored to the cradle at the bottom of the dock, and the latter raised again by pumping the water out of the fifty compartments. The pumping out of the water is effected in four hours by two two-cylinder engines, driving four centrifugal pumps. The steam of six atmospheres required for feeding the engines is supplied by four boilers. The dock has a floating power of 6,600 tons, and is consequently calculated to raise any ship, fully equipped, of the German navy, the *König Wilhelm* alone excepted. The entire material required for the dock was furnished by German firms; its whole weight, when completely fitted up, will be 5,000 tons. In case the repairs of the docked vessel are of a smaller nature, such as cleaning and painting of a ship's bottom, for instance, they may be executed in the floating-dock. But should the work required to be done be heavy, or the repairs necessitate the hauling of the ship ashore, the floating-dock, with the vessel inside, is towed into the dock-basin.

The latter is constructed close to the bank of the Vistula, in the form of a trapeze, the shortest side of which, its head, of a breadth of 122 ft., is open towards the river, and may be closed, perfectly water-tight, by iron pontoons. The two sides of the trapeze to the right and left of the dock-head are each 316 ft. long. The end opposite to the head is rounded off, and has a length of 240 ft. in the segment. The greatest length of the basin from the head to the rounded end is 333 feet, from the latter of which the horizontal slips radiate. The bottom of the dock-basin is formed of 7 ft. 6 in. of concrete, upon which follows a course of brickwork, covered again by granite slabs. The enclosure-walls are 19 ft. 6 in. high, and constructed of brickwork, faced also with granite. The depth of water in the dock-basin, at an average water-level of the Vistula, is 14 ft., which is sufficient for all requirements, as the iron floating-dock with its heaviest burden draws only 13 ft. of water. When the floating-dock has been anchored opposite to the horizontal slip to be used for repairing the vessel, it is lowered by letting in water until it rests upon the granite bed of the dock-basin, and thus the required resistance is supplied for hauling the ship off the floating-dock and on to the slip. The dock-basin is closed, as a rule, towards the river only when repairs on the floating-dock itself become necessary. In that case the basin, after the dock has been towed in, is closed at the head by the insertion of the above-mentioned pontoons, and then pumped dry by two centrifugal pumps, each capable of raising 3,300 gallons per minute.

Of the three horizontal slips, which, as already remarked, radiate towards the interior and rounded-off end of the dock-basin, the centre one has a slipway of a length of 344 ft. 6 in., by a width of 66 ft., and a supporting power up to 7,000 tons. The length of each of the two side slips is 315 ft., their width 59 ft., and their supporting power 4,000 tons each. The centre slip, therefore, will take any ironclad of the German navy, with the exception of the *König Wilhelm*, while the two side slips are intended solely for unarmoured vessels. The hauling up of the ships on to the slips, and the hauling off into the iron floating dock after repair, will be effected by means of cast-steel chains, by hydraulic machines, with five pressure cylinders and a recoil cylinder, of a traction-power of 1,800 tons. The pumps which supply this power are worked by a locomotive steam-engine, of 90-horse power, which is used also for working the two centrifugal pumps serving for emptying the dock-basin.

The extent of the labour required for constructing these vast works may be estimated by the following data. In excavating the pit for the dock-basin, over 3,000,000 cubic feet of soil had to removed; for enclosing it, 26,400 square feet of pile-planking and 6,358 cubic feet of fir timber were used. For laying down the concrete bed of the dock-basin, nearly 580,000 cubic feet of broken stones, 5,438 tons of ground trass, 160,500 cubic feet of unslaked lime, 2,400 tons of Portland cement, and 187,700 cubic feet of sand, were required. The brickwork for the enclosure-walls, &c., consumed 1,800 millions of bricks and 5,500 tons of Portland cement. For covering the bed and the brickwork, 53,000 cubic feet of ashlar, granite, and sandstone, and 1,800 tons of Portland cement, were used. For the foundation of the slips, 5,000 pieces of round timber, each 66 ft. long, and for constructing the slipways 2,000,000 bricks, 8,000 tons of Portland cement, 105,000 cubic feet of sand, and 24,700 cubic feet of granite slabs, were required. All this material is native produce, with the exception of the last-mentioned 24,700 cubic feet of granite slabs, which have been imported from Sweden.

OBITUARY.

THE Düsseldorf school of painting has just lost two of its disciples prominent in their respective lines. On December 1st died FRAZ Ittenbach, at the age of sixty-seven. He belonged to the Roman Catholic church painters, who form a characteristic group in the older Düsseldorf school, and was one of its best-known and veteran members. His chief works are altar-pieces, single figures being his principal productions; but there are also existing some of his saints' groups and compositions representing scenes from Bible history.

A much more widely-known painter of the Düsseldorf school was Karl Hübner, who died on December 5th, aged sixty-six. He was a genre and landscape painter, whose works enjoy a wide reputation. Being extremely active and versatile, and using the brush with facility, the number of works left behind by him is very large. He created an enormous sensation in 1844 by one of his best and largest paintings, "Silesian Weavers." In it he portrayed the sufferings of the weavers (Upper Silesia had then passed through one of those periodical famines one of which has just now set in again) and the harshness of Silesian employers, the time chosen being pay-day. This work brought him into public prominence much against his will, and he was looked upon as a democratic painter. He, however, made use of this current of public opinion, and soon several other important productions of his hand saw the light, of which "The Game Laws," "The Emigrants," "The Distrain," are perhaps the best. His popularity was not lasting, especially as with age his productions became fewer, but he was widely esteemed to the end for his generosity and liberality towards his brother artists.

The death is also announced of Knud Baade, at Munich, on November 24th, at the age of seventy-two. Baade was a Norwegian by birth, but attached himself early in life to the Munich school. He was a landscape and marine painter, and very productive. He was settled at Munich over forty years.

Artisans' Dwellings in Manchester.—A correspondent of the *Manchester Guardian* writes, under date the 22nd ult.:—"I am one of a small band of friends, who joined together, early last winter, for the purpose of beginning, on a very small scale, a work in Manchester, such as Miss Octavia Hill has so long and so successfully carried on in London. The very gist of Miss Hill's scheme is personal systematic inspection. In the same manner, we proposed to become the landlords of as many houses as we could afford to buy,—say one small block at first,—to put them into decent sanitary repair, to let them at rents duly proportioned to our outlay upon them, and to depute one or more of our own number to visit and inspect regularly once a week. The abnormal condition of things in Manchester last winter prevented the scheme being immediately carried out. But it is only in abeyance at the present moment. We but wait to see whether the times are favourable for beginning, not wishing to injure our work by making a false start."

PROPOSED NEW BUILDINGS ON THE THAMES EMBANKMENT.

THE CITY OF LONDON SCHOOL.

AT the meeting of the Court of Common Council on the 11th inst., the City Lands Committee presented a report recommending the granting to the Governors of Sion College, for the erection of a new hall, library, and offices, a lease of a piece of ground on the Victoria Embankment, at 1,265*l.* per annum, with the option of purchasing the freehold at twenty-five years' purchase. The site proposed to be leased to the college had a frontage to the embankment of 75 ft., and a depth of 130 ft., and abutted on the new street it was proposed should be formed from the Embankment to Temple-street. Another report on this subject was also submitted by the City Lands Committee, who, on the petition of the Grocers' Company, asked for authority to negotiate for granting them a lease of a piece of land with a frontage of not less than 140 ft. on the Victoria Embankment, for the purpose of erecting a new hall and offices for their corporate business, with the option of purchasing the freehold. The report pointed out that the entire frontage owned by the Corporation on the Embankment was 650 ft. Of this they were in negotiation, in respect to 270 ft., with the Government for the erection of the new Royal Mint, and they proposed, with the Court's consent, to lease 75 ft. to the Sion College authorities, at a rent of 1,265*l.* per annum, with option of purchasing the freehold for 31,625*l.* or twenty-five years' purchase. Another range of 193 ft. was proposed to be devoted to the purpose of building the new City of London School; but it is thought that 135 ft., or thereabouts, would be amply sufficient. Under these circumstances the committee asked leave to continue their negotiations with the Grocers' Company.

Mr. G. Shaw, in proposing the adoption of the first report, having reference to Sion College, said that on the 27th of February of this year the committee were instructed to negotiate with the Government for the sale of a piece of land on the Embankment as a site for a new Mint, and those negotiations were now nearly complete, and the principal reason why the committee had not hurried on those negotiations was because the committee wanted some basis upon which to ascertain the market value of the site. The Government knew the price which the Corporation had paid, and looked at the question from that point of view, but the committee took another view, and did not agree with them. The original plan presented to and agreed upon by the Court showed that the frontage of the City of London School site was 193 ft., that of Sion College, 75 ft., leaving, after allowing for the Mint, 73 ft. or 74 ft. to deal with. In the negotiations with the Grocers' Company it was found that they would not be able to come to terms unless some alterations were made, and he (the speaker) then directed that the chairman of the City of London School Committee should be asked to attend a meeting of the City Lands Committee, so that they might agree upon a plan which would suit all parties. Although the frontage of the school would be curtailed, the same amount of area would be retained, and the playgrounds would be as large as was provided by the plans sanctioned by the Court. By the changing of the axis of the hall to north and south they would save about 40 ft., and another alteration would save 27 ft. more. By the modification of the appurtenances and the rooms in front they could save more space, and in these ways a saving of 72 ft. of frontage could be effected without the school being in any way injured. Besides, he believed the change would be an improvement in the façade of the building.

Mr. Murrell thought the Court was entitled to some further information as to the value of the particular site it was proposed to allot to Sion College. They were asked to let that choice site, with a large frontage and a small depth, at only 2s. 7d. per foot. If the land was thrown into the market he had no doubt that a very much larger price would be obtained.

Mr. Felton said he rose with reluctance to oppose the report. From the manner in which the subject had been stated to the Court it would appear that he and his colleagues were enemies to the interests of the Corporation. In 1877 it was determined to remove the school from its present site to the Embankment, and the architect was asked to prepare plans for a building which would cost about 50,000*l.* or 60,000*l.* Two plans were prepared, but the committee did not entertain either of them, on account of the great expenditure that would be involved in carrying them out. In December, 1878, having obtained the land on the Embankment, the City Lands Committee were applied to to stake out the site. The School Committee did not ask for any specific number of feet for a frontage, but left the matter entirely in the hands of the City Lands Committee. In reply, the City Lands Committee stated that the staking out of the ground was a matter entirely in the hands of the City of London School Committee. The School Committee then gave instructions to the Architect to stake out the ground, and that was performed by Mr. Murray, of the City Architect's office. Having had the land staked out, the committee took steps to obtain plans and designs for the new school, and from the particulars supplied to the competing architects the new building was to have a frontage of 192 ft., a side frontage of 327 ft., and a back of 200 ft. In accordance with these particulars plans were prepared. The plan and design which was ultimately accepted by the Corporation showed a frontage of 192 ft. 3 in. The evidence of Mr. Vigers, upon which the Act of Parliament had been obtained, showed that the area of the site was 1¼ acre and that the frontage was 192 ft. 3 in. He (the speaker) maintained that if they now altered these plans they had obtained the Act of Parliament by false representations. There had been fifty-three designs sent in for the school, and he asked was it to go forth that they had been engaged in a solemn farce in dealing with the question by which the valuable time and ability of so many gentlemen had been wasted?

Mr. De Keyser said that the Mint would disfigure the Embankment, and by the appropriation of the 75-ft. frontage for Sion College the Corporation would lose the adequate utilisation of a quantity of back land. He trusted the Court would not entertain the proposal of the committee.

Mr. Phillips asked if the plans of the school would have to be remodelled if the report were agreed to?

Mr. Shaw.—There will be no difficulty in the matter; but the City Lands Committee have suggested that the firm of architects whose plans were adopted should put themselves in communication with us in the matter.

Mr. Beck said he would not give much for the character of an architect who said that he could not modify his plans to a reduced frontage. It was only a question of turning round the large hall. If the frontage were reduced, it would make the building more handsome than it was shown to be on the plans.

In reply to a question put to him as to the value of the land,

The Architect (Mr. Horace Jones) said,—I believe the actual sum will figure out to something like 2s. 7½d. per foot, but it is not let in this way; that is not the basis of the valuation. I do not consider 2s. 7½d. a particularly low price, or I should not have recommended the City Lands Committee to have accepted it. There are some portions taken at a higher price than 2s. 7½d., while others have been taken at a lower price.

Mr. Shaw mentioned that portions could not be built on, owing to the railway passing underneath.

After considerable discussion, both reports were adopted.

Salting Roads in Frosty Weather.—At the meeting of the Marylebone Vestry on the 13th inst., Mr. Sedgwick moved that the salting of roads and pavements during frosty weather throughout the parish be strictly prohibited by the Vestry, as the mixing of snow and salt produced a liquefaction that lowered the temperature greatly below freezing-point. Animals and men having to wade through this briny slush suffered, to the very great injury of their health. Dr. Macgregor Croft seconded the motion. Mr. Stevens opposed, saying that the General Omnibus Company were not foolish enough to injure their horses by having the roads salted. Mr. Hallam, as to the snow and salt being so disastrous, asked, Did ever any one know salt water to freeze? He had mixed snow and salt, but after thirty-six hours there was no frost. He had heated water to 180° Fahr., and it froze in one thirty-sixth part of the time when exposed. The surveyor said the omnibus routes were salted judiciously. The motion was lost.

ARTISTS AND THE HUMAN FIGURE.

ROYAL SCOTTISH ACADEMY.

On the 10th inst., in the Life School of the Royal Scottish Academy, Professor Turner, M.B., Honorary Professor of Anatomy to the Academy, gave the first of two demonstrations from the living subject.

Professor Turner said that when appointed to the honorary Professorship of Anatomy to the Academy, he thought that he ought to do something to show that he esteemed very highly that distinction. He turned over in his mind how this might most efficiently be done; and it seemed there were two ways,—either to prepare a series of formal discourses on the bearings of anatomy on an artistic education, or to give to the students a series of demonstrations on the living model, to point out the meaning of various marks appearing on the surface of the body, and show how those marks were caused by the construction of the inward parts. He did not attach an overweening importance to the application of the anatomy of the inward parts of the body in the education of artists; because, from all they knew of the artistic education of the ancient Greeks, who were the most perfect delineators of the human form in marble that the world ever saw, there was no reason to believe that they either had opportunity of making dissections, or of using dissections made by others. They seemed to have acquired their marvellous power of representing the human form, partly from the fact that they were well supplied with admirably-moulded forms, and partly from their possessing wonderful manipulative skill and artistic aptitude. But, while they must give to the ancient Greeks the greatest credit for artistic aptitude and manipulative skill, they could not fail to recognise that, if an artist had some knowledge of that which lay beneath the skin, knew the forms and position of the bones, and the forms and position of the principal muscles, more especially those that lay close to the skin, he would understand what it was that caused the various surface markings he had to depict, either in painting or in sculpture, and would possess greater readiness in bringing out the characteristic forms of the surface than when entirely ignorant of those matters. The professor then proceeded, with the help of a skeleton and a set of anatomical diagrams, and with constant reference to a living model, to show how the arrangement of bones and muscles determined the external configuration of the shoulder and arm.

BUDDHIST REMAINS IN THE JELLALABAD VALLEY.

SOCIETY OF ARTS.

Mr. William Simpson, the accomplished artist and antiquary, who has travelled we do not know how many times round the world for the *Illustrated London News*,—keeping his note-book, no less than his sketch-book, always open,—on the 10th inst. read a paper (embodying the results of some recent explorations in the Jellalabad Valley) before the Society of Arts. As newspaper readers will know, for the paper has been fully reported, he was quartered for some months last winter in the valley with the force under General Sir Samuel Browne; he visited most of the remains, and made sketches of them; and he made a number of excavations under the late Sir Louis Cavagnari. We had, he observed, known of Buddhist remains in the valley from the date of the first Afghan war. After summing up our former knowledge, Mr. Simpson said the Buddhist remains of the Jellalabad Valley were little more than mounds. Here and there the crumbling remains of a stupa might be seen, and fragments of walls could be traced in the heaps. The immense number of these mounds astonished him. As they knew that these Buddhist establishments were monasteries, the extent of the remains seemed to him to indicate in the past a population of ascetics alone far greater than the whole population of the present day. That pointed to another fact of importance,—there must have been more cultivation of the land in the Buddhist period than now. Large plains of stones and dust which were in all probability bearing crops in former times have been found. At the present day there was no art or architecture. The houses were built of mud; the walls of Jellallabad were formed of that material only, and the gates were wooden structures of the rudest kind. In the Buddhist period, on the contrary, the country must have been under a high state of civilisation, where considerable wealth abounded, and art was cultivated. The vestiges of that art still remaining showed that the religious structures of the time were large and important. A style of architecture was followed in which sculpture was largely practised, and in which the effect was heightened by the use of colour and gold. The structures connected with the practice of the Buddhist faith were viharas, or monasteries,—places in which each monk had his cell, and with buildings for worship. One prominent form of the ritual was connected with structures which were now known as "topes," or "stupas." The origin of these monuments was thus explained:—At an early period the simple grave heap was, in cases of important persons, increased into a large mound or barrow. Following this, stones were added, and the heap became a cairn. Later still the cairn took a structural form. In India, under Buddhism, that development assumed the form of the tope. It would thus be seen that the tope was essentially a tomb. That the Seven-terraced Tower of the Euphrates Valley and the Pyramid of the Nile were only varieties of the same growth was highly probable; but the connecting-links of evidence on the subject were as yet sadly deficient. We were equally destitute of the connecting-links between the Buddhist tope and the cairn. If any vestiges could be found in India to tell them what form the heap of stones had assumed towards the Buddhist period, it would be a discovery of some importance. At Bamian, 100 miles to the north of Cabul, there was a city of caverns, and there were caves in other places. These were now the winter homes of nomadic tribes. There were traces of decorations and of Buddha and Buddhist saints on the plastered interior. A strangely composite character belonged to the architecture of the Buddhist period in Afghanistan. It had received a capital from Persia; a Corinthian capital, with frieze and mouldings, from Greece; and an arch from India. It was at Venice that the architecture of Western Europe met and combined with the Eastern style of Byzantium. Afghanistan, although widely separated and vastly different in many respects, had yet some points of resemblance to the city on the sea. It was a trade route, and also a gate of conquest. These conditions brought together the art of Western with that of Eastern Asia, and combined them into one. An interesting description was given of the excavations at Jellalabad.

BUILDINGS FOR POOR-LAW ADMINISTRATION.

Chelsea.—The Chelsea Board of Guardians have under consideration proposals, involving an expenditure of 20,000*l.*, for the enlargement of the workhouse and infirmary, at the instigation of the Local Government Board. The Guardians do not mean to incur so great an outlay if they can avoid it.

Lambeth.—The workhouse and infirmary at Lambeth, both of them extensive establishments, and only erected within the last few years, are reported to be very full,—indeed, over-crowded, — and the Local Government Board has been urging the Guardians to re-open the old workhouse in Princes-road. The Guardians are reluctant to do so, preferring to keep their establishments concentrated at Kennington. It is proposed to provide additional accommodation there, if possible, for 500 persons. If this cannot be done, it is suggested as an alternative to build a new workhouse at Norwood for the aged inmates. In either case the Guardians do not propose to use the old workhouse in Princes-road, except temporarily, on the ground of its unsuitability. The sale of this property would, they urge, go far to pay for the new accommodation required.

A Large Laundry.—The first laundry of the London and Provincial Steam Laundry Company is now in course of erection at Battersea Park, and will be completed about Midsummer next. The building, which, its projectors say, will be the largest of its kind in the world, will be fitted with machinery of the most complete description, and will be lighted by the electric light. Messrs. Scrivener & Co., of Alpha-road, Regent's Park, are the contractors, and Mr. Ernest Turner, of Regent-street, is the architect.

THE FALL OF HOUSES IN TOTTENHAM-COURT-ROAD.*

The inquest on the bodies of John George Martin and William Viles, who were killed by the fall of houses in Tottenham-court-road on the 20th ult., was resumed and concluded on the 12th inst. Mr. Grain, barrister, represented the District Surveyors' Association, Mr. F. T. Peacock appearing for Mr. Lewis, the owner of the property.

Michael Doody, one of the men injured by the fall of the houses, said,—I was on the first floor of No. 171 when the houses fell. Martin was also there cutting away the chimney-breasts. I was knocked down and injured, and brought to this hospital. I cannot account for the accident, but I had heard it remarked that the place was not very safe.

By Mr. Grain.—The bressummer was a little rotten at the corner, and it was covered over with cement or something. It rested on two piers, the "scaley" part resting on the part now standing. I suppose it was covered to hide it from the surveyor. There was some roughness, and Mr. Shields, the foreman, gave instructions for it to be covered over.

Mr. Spencer Chadwick said,—I am architect to the London and country estates of the Marquis of Salisbury. I have examined the fallen premises in Tottenham-court-road, and have formed an opinion as to the cause of the accident. I think that the lowering of the floor displaced the brickwork in front and caused the front wall to fall. I do not think the district surveyor is in any way responsible. The district surveyor has no power to stop the progress of the works; he has only to see that the Building Act is carried out. A magistrate's order is the only authority for stopping the works. Before a district surveyor can take any action the matter must go before a magistrate, who has power to inflict a fine if the structure is proved to be dangerous,—a point frequently not decided until after several remands.

Mr. Alfred Shields, the contractor for the works, recalled, said,—I received instructions from the leaseholder, Mr. Lewis, to alter the first plans. I did not refer the matter to the architect. We had finished the floor on the Saturday, and on the Monday I received instructions from Mr. Lewis to lower the floor in the letter produced:—

"23, Ampthill-square, Saturday night,
November 15, 1879.

Mr. Shields,—Dear Sir,—I find there is an awful mistake in the rooms of the first-floor, looking over the drawings this evening; a copy having been given to the superior landlord, it must be immediately rectified. I very much regret this mistake, but I consider you can lower the floors without interfering with the front girders by putting joists to take the floors and lowering them down again bodily. I shall meet you at nine on Monday morning.

Yours faithfully, Lewis Lewis."

By Mr. Grain.—I proceeded to act upon that authority. I did not consider there was any danger in making the alterations. I did not consult the architect, as I did not know his address. I was not aware that a pillar had come away the week previously to the accident. I was on the works at the time when the slip in the brickwork occurred.

Mr. Shields, sen., recalled.—As foreman of the works for my son, I was aware that there was a disposition of the pier carrying the girder to yield, and I gave instructions for the men to put it right during their dinner-hour. It was pinned up with slate and cement. I did not tell my son, as I thought so little about it. It came away from the party-wall. My son saw what had been done. I did not inform either the architect or district surveyor. There was a portion of the wooden bressummer, the end portion, a little "scaley"; it was covered over by my directions. It is standing now.

By Mr. Grain.—Mr. Wallen, the district surveyor, told me to put in raking shores, but I did not do so because I saw no necessity. The work was complete when he told me, back and front. No story-posts were specified by the architect. I put a temporary story-post against the pier. It was put up by my direction by the man who is killed.

Mr. George James Thomas, examined.—I am chief clerk in the Dangerous Structures Department of the Metropolitan Board of Works, and notices of all dangerous structures received by the Board pass through my hands. I received no notice that these premises in Tottenham-court-road were dangerous. I have considerable experience in these matters. The notice gene-

* See pp. 1325, 1356, *ante*.

rally comes from the builders or contractors, and undoubtedly they are responsible. The district surveyor merely surveys and gives instructions as to what shall be done, but has no power to stop works. He becomes, in fact, the surveyor of the Metropolitan Board of Works, by whom he is appointed. [The witness put in a variety of forms of notices which it is necessary to give for various purposes in carrying out alterations of buildings.]

The Coroner (Dr. Hardwicke) having summed up the evidence,

The jury, after nearly an hour's deliberation, returned into court and handed to the Coroner the following as their verdict:—

"That the falling of the houses Nos. 171 and 173, Tottenham-court-road, was caused by the culpable negligence of the builder, Alfred Shields, and his foreman, James Shields, in carrying out the work intrusted to their charge, and by neglecting to carry out the instructions given by the district surveyor. The jurors regret the inefficiency of the law in relation to buildings in not giving power to district surveyors to stop works being carried on in a reckless manner. The jury further recommend that serious cases under the Building Act should be tried in a more summary manner before a magistrate, assisted by a practical assessor, and that builders convicted of recklessness in building structures should be liable to a heavy penalty."

The Coroner pointed out to the jury that a verdict attributing "culpable negligence" was tantamount to a verdict of manslaughter, and he desired to know if he was to understand it in that sense.

After some further consultation, the foreman said the jury did not mean criminally culpable, but their verdict was intended to convey a strong censure on the negligence which had been exhibited in carrying out the works.

ENLARGEMENT OF THE ROYAL HOTEL.

We are informed that De Keyser's Royal Hotel, situate on the Thames Embankment, at the corner of New Bridge-street, is about to be very considerably enlarged by an extension from its present eastern boundary along the vacant angular piece of land to William-street, at the corner of New Bridge-street. This piece of land was some time ago announced as on sale for general building purposes, but was not disposed of, and it is now stated that the new hotel, spacious as it is, is inadequate to the magnitude of the business, rendering an enlargement necessary. The present building has a frontage upwards of 100 ft. in length, and when extended to the boundary in New Bridge-street it will have an elevation with a sweep from west to east of something like 280 ft. The plans are said to have been prepared, and the contract for the enlarged building entered into.

LIBELLING ARCHITECTS.

BOTTERILL AND ANOTHER *v.* WHYTEHEAD.

This case, upon which we commented in our issue of the 15th ult.,* was before the Lord Chief Baron and Mr. Justice Stephen in the Exchequer Division of the High Court of Justice on the 6th inst., when the rule (granted by Mr. Justice Hawkins and Mr. Baron Huddlestone) for a new trial was argued. Mr. Digby Seymour, Q.C., Mr. Cyril Dodd, and Mr. Kemp supported the rule; Mr. Waddy, Q.C., and Mr. Sutton showing cause against it.

The rule was granted on the grounds that the verdict was against the weight of evidence; that the letters were written on a privileged occasion, not exceeded by the writer; that there was no evidence of express malice in the defendant, and the learned Judge ought to have directed a nonsuit or a verdict for the defendant; that the learned Judge did not sufficiently instruct the jury that the question for them was, not the fairness or unfairness of the letters in fact, but whether there was actual malice in the writer; and that the damages were excessive. Lord Justice Bramwell, before whom the case first came (at the Leeds Assizes), in summing up, said,—"It is no imputation to say of a man that, although competent in his profession that he carries on generally, he is not a specialist in a particular branch which is not one of the ordinary branches of his profession;" also that "if the repairs of this church were of such a character that any one fairly interested in them might properly address himself to those who had influence in determining how they should be carried out for the purpose of having them properly restored or preserved, it would have been perfectly legitimate so to do."

Mr. Waddy, in showing cause against the rule, said the attempted justification set up by the defendant was, "I meant, no such experience as in my opinion was requisite." At the trial the plaintiffs were prepared with ample evidence of capacity as architects; but as that was not really impugned, the Judge rejected it as irrelevant. The defendant, however, had given evidence by a side-wind to the contrary. Were the jury justified in finding the letters libels?—that was the real question.

Mr. Justice Stephen.—If you were to say of an architect that he had no experience in building pyramids, would that be libellous?

Mr. Waddy.—No, for that would not be in the usual course of his business. But if you said of a tailor, "He cannot cut coats," it certainly would. The defendant says, "You mean to give him a job for which he is not fit, and as an architect he ought so to be; if you allow him to touch it, it will be ignorantly tampered with."

Mr. Justice Stephen.—I can see now there is a sense in which the jury might have found the letters libellous. But if the real meaning of them is only "Beware what you do," and the jury have misread it as an attack on personal skill, that would show that the verdict is against the weight of evidence.

Mr. Seymour, in support of the rule, said the question was one of the plaintiff's peculiar fitness to do a particular work. He drew attention to the animated discussions going on in the *Times* and elsewhere on the restoration of St. Alban's Abbey, and the proposed defacement of St. Mark's, at Venice, and the free comments made on all hands on the matter.

Mr. Justice Stephen.—The matter seems one which they cannot discuss with calmness; just like the classical languages, over which people invariably lose their tempers before long.

Mr. Seymour proceeded to read a passage from Mr. Ruskin's "Seven Lamps of Architecture," p. 160, as embodying Mr. Whytehead's feelings on the subject, and

Mr. Justice Stephen said,—Suppose the greater part of the "Seven Lamps" had been written about living architects instead of Venice, cannot you imagine cases in which Mr. Ruskin would have been defendant?

Mr. Seymour pressed that the expression "no experience in church work" had been fully made out; certainly not such as would fit the plaintiff to undertake such a work as the restoration of this unique and interesting gem of Gothic art, which dated from somewhere like 1388. In thirty years' experience the plaintiffs had only put the roof on one Gothic church—St. Mary's, Sculcoates; but there was nothing of Ancient Gothic about that. One of the defendant's witnesses had styled it "poor Modern Gothic." As to the plaintiffs' plans, the architects called by the defendant all condemned them—Mr. Fowler, Mr. Broderick, and Mr. Gilbert Scott said the spirit of the work would be destroyed and its value as an historical building entirely gone if his plans were followed. All this showed the defendant was zealously and properly anxious that the work should fall into the hands of one who had studied deeply in the ancient school and was attached to it. No sensational letter was written by the defendant to any newspaper, the *Builder*, any Church paper, or even the *Hall News*. He wrote to people he knew, and to friends, not with any reckless disregard for Mr. Botterill's character.

The Lord Chief Baron delivered judgment on the 13th inst. At the close he said,—The learned Judge who tried the cause held, and, I think, most correctly held, that there was evidence of express malice, and that evidence was fairly and fully left to the jury, and the jury found, and, I think, properly found, that there was express malice; for in this case the defendant had no manner of interest in the question of the employment of the plaintiff to execute the work in question which all mankind, or at least every admirer of ancient art throughout England, did not possess equally with himself. Then, lastly, it is contended that the damages (50*l.*) are excessive. But who can say that the effect of this letter may not actually have been to prevent great numbers of persons from employing the plaintiff in the way of his profession? On the whole, therefore, I am of opinion that the letter is libellous, and that the verdict of the jury ought not to be disturbed, and, therefore, that the rule or conditional order must be discharged.

Mr. Justice Stephen was of the same opinion.

Rule discharged.

THE FOUNDING OF "BIG BEN."

STAINBANK *v.* BECKETT.

In the Court of Appeal, on the 10th inst., before the Lord Chief Justice and the Lords Justices Bramwell and Thesiger, this case was heard. It was an appeal on the part of the plaintiffs from a refusal of the Lord Chief Baron and Mr. Justice Stephen, in the Exchequer Division, to order the defendant to amend his statement of defence.

The plaintiff was a bell-founder, carrying on business at Whitechapel, under the style of Mears & Stainbank, and the defendant was Sir Edmund Beckett, bart. The plaintiff's firm before he joined it carried on business as Charles & George Mears, and had cast for the Government the bell now at Westminster, called "Big Ben." The plaintiff, in his statement of claim, alleged that the defendant had libelled him in a series of letters to the *Times*. The letters in question were written by the defendant, and contained expressions which the plaintiff contended were libellous; such as, "I agree with Mr. Hawsis about the present condition of Big Ben, which is a disgrace to the nation as well as its founders." One of the letters also spoke of "the oldest and worst foundry in England," which the plaintiff alleged applied to his foundry, as it had been established longer than any other.

The statement of defence stated that "the said letters did not in any way relate to or affect the plaintiff, and that the statement of claim, so far as it set out statements referring to the firm of Charles & George Mears, and the casting of Big Ben of Westminster, was immaterial and irrelevant, and such as the defendant ought not to be called on to plead to; but inasmuch as the letters referred to the firm of C. & G. Mears alone, the statements were fair comments on a matter of public interest, and were true in substance and in fact." The defendant also contended that these statements had nothing to do with the plaintiff, as they were made with reference to a time before he joined the firm, and as he had nothing to do with the casting of Big Ben.

The plaintiff, however, applied to the Exchequer Division to have the statement of defence amended, as he contended the issue thus raised by the pleading was one which he ought not to be called upon to try, and was too general in its terms, and was, therefore, expensive and embarrassing.

The Exchequer Division refused to order the defendant to amend, and the plaintiff, therefore, now appealed.

Their Lordships proposed that the respondent should agree to give the appellant as full particulars as he could as to his justification for the statements he had made which he alleged to be true, and that the costs of the motion should be costs of the cause, and that the order of the court should be made accordingly.

This proposition was accepted by the counsel representing both parties.

LIGHT AND AIR.

PHILLIP *v.* FITCH.

This case was lately before the Master of the Rolls, on a motion for the defendant to have an *interim* injunction removed, to enable him to proceed with the erection of a warehouse at No. 3, Bury-street, St. Mary-axe.

During the vacation, on the motion of the plaintiff, an injunction was granted restraining the defendant from proceeding with the erection of his new building beyond the height of the old one; otherwise the light and air of the dwelling-house adjoining would be materially obstructed. The defendant had proceeded to build a back wall to the height of 35 ft. 6 in., or 7 ft. above the old one, and he had also built over a vault, bringing the new building within 19 ft. of the plaintiff's house. The curved roof would bring up the building to 46 ft., and beyond that there was a skylight which was 6 ft. in addition.

The Master of the Rolls said that this was a case where personal inspection was necessary. He would much rather that there was a reference.

Mr. Locock Webb (for the plaintiff) said that he was most anxious to have a settlement of the dispute with as little delay as possible, but he felt that it was necessary to protect his rights. He had no objection to a reference.

Mr. Marten (for the defendant) said that it was a most serious matter for the building to be stopped, and he considered that an undertaking ought to be given as to damages.

The Master of the Rolls said that there must be an undertaking as to damages, and he would refer the question, the costs of the reference to be paid by the defendant in the first instance.

ARCHITECTS' DUTIES FOR FIVE PER CENT. COMMISSION.

Is an architect bound, for a commission of five per cent., on the completion of a work to measure up the whole of such work to test if the rooms, passages, walls, chimney-breasts, doors, windows, roof and other timbers, &c., are in accordance with his specifications, plans, &c.? And is he bound to climb on to the roofs and check the slating, the thickness and sizes of the lead flashings, and other such-like things? And, moreover, in a case where work has been covered up or hidden during the time between his visits to the work, and where no clerk of works is employed, is he to be held responsible to check all these things? In lead gutters, for instance, when these differ from the plans by their being made larger (by order of the architect), and when the architect visits the work and finds the lead worked and fixed and the slating done, and the builder tells the architect that the lead works up under the slates on each side of the gutter 9, 12, or more inches, is an architect justified, in the absence of a clerk of the works, in taking the builder's word in this respect, or is the architect bound to take off slates to satisfy himself how far the lead had been worked up on to the roofs under slates? Again, is an architect bound to check all minute details throughout a work, or is he merely responsible for seeing that the work has been carried out correctly in a general sense?

An architect would not be bound to climb a building and measure every corbel, check the sizes of all gutters, down-spouts, &c., I presume, but merely to take a general view of the premises, and see that these things exist in the building, and in the positions shown and specified.

X. Y. Z.

The Holborn Town Hall, and New Bank, Sunderland.—At both these buildings, illustrated in our last week's issue, Messrs. Chubb & Son supplied the whole of the strong-room doors, safes, and strong-room fittings.

* "Sectarian Architecture," p. 1254, *ante*.

NEW WORK FOR THE ART-UNION OF LONDON.

For the current year this society offers to its subscribers, in addition to the chance of obtaining one of the valuable prizes to be distributed by lot next April, an impression of a plate, engraved in pure line, by Mr. Lumb Stocks, R.A., from the well-known painting by the late E. M. Ward, R.A., "Dr. Johnson awaiting an Audience of Lord Chesterfield." The original of this fine work, first exhibited in the Royal Academy in 1845, is in the National Gallery, and is justly regarded as one of the most characteristic of our modern school. Mr. Ward was a special exponent of two phases of art, which ran in different, though parallel, grooves. The one may be designated as purely historical, embodied in such subjects as "The last Sleep of Argyle," "The Execution of Montrose," and "The Disgrace of Clarendon"; the other, of a more familiar character, such as "Dr. Johnson and Goldsmith," "The South Sea Bubble," and the one now under notice. In all, we have evidence of the prevailing tendency of the artist's genius, a combination of the styles of Hogarth and Wilkie.

The picture now before us vividly represents such a scene as may have occurred in the anteroom of Lord Chesterfield, one of the chief patrons of literature and art of that day. The great lexicographer had, no doubt, on numerous occasions waited in vain in the "outward rooms" of the nobleman for an opportunity of laying before him the proposal, perhaps the first proof-sheets, of that dictionary which was to make his name a household word for generations, and always without success; and galling, indeed, it must have been to him to see others whom he would but lightly esteem preferred before him. In the present case, a lady of the opera, powdered and patched, comes forward, after an audience of the peer, accompanied by her waiting-maid and page, bearing her lute, having performed a part, written by the composer who ambles by her side, and who is whispering in her ear some remark not flattering to the "old squaretoes," who, in company with several others,—such as a jockey who rides his lordship's horses at Newmarket, a parson who has dedicated to his lordship a volume of sermons, a sea-captain minus a leg in the wars, and others,—is waiting for the chance of being admitted to the great man. It is evident that the doctor was never favoured with the interview which he sought, from the undying revenge he exacted in the letter he wrote, when the dictionary was published, repulsing the noble lord's proffered favour. The incidents of the occasion are most happily rendered in the picture, and the translation into black and white by the skilful burin of Mr. Stocks is as complete as possible.

The picture has the merit of telling its own story, and at the same time of not exhausting interest in the first glance; but leaving many minor details, which will engage attention for a long time. We have reason to believe, from the returns already reported, that this will prove an attractive print with the subscribers.

The Almanack of the Art-Union is now ready for the members. This little book, besides the general information given in such works, contains particulars as to artistic and scientific societies,—and the dates of meeting of the latter,—which are not to be found concentrated in any other publication.

We some time since gave a view of the elevation of the new house lately built for the Art-Union, at 112, Strand; and in the galleries are now to be seen the original picture by Macliss of the "Death of Nelson," also the companion painting of "Wellington and Blücher meeting after Waterloo," and other works, which will repay a visit, and to which the public are freely admitted.

Knightsbridge New Barracks. — This large pile of buildings, lately illustrated in our pages, is expected to be ready for the occupation of the troops early in the new year. Rapid progress is being made with the internal fittings, and we understand that Mr. James Hill has just executed an order for 526 of his improved locks, together with 200 latches and furniture complete, all of which have been specially selected by the War Department. It is a noticeable feature of these locks that the keys all vary throughout, and that every key has its own number,—a corresponding number being stamped on the bolts of each lock.

IN RE SCHOOL OF WOOD-CARVING.

Sir,—Modern art talk is commonly innocent of logical connexion. Of keeping to a point, it shows not the slightest heed. It is here, there, and everywhere, in self-contradiction, at a breath. A most amusing instance of this, quite Hibernian in its character, is afforded by Mr. Rogers's letter of last week, in which, after twitting me for not noticing that his dictum about "employer, designer, and carver," was conditioned with the *now*, immediately proceeds to deprive Gibbons of the right to be considered an artist, and, with his little best, to endeavour to prove that that dictum was equally applicable to the *then*.

Mr. Rogers has, in his several letters, made an abortive attempt to deprive the wood-carver of any title to be considered an artist. In his first letter he reduces him to a mechanical *woodpecker*, subject to the man of business and the designer. He would reduce him to the status of a "hewer of wood," pure and simple. And, not content in his first letter with this mischievous intent, he proceeds in his third to cast doubts upon Gibbons himself being anything more than this,—of being in any true sense an artist. Does Mr. Rogers know that one of the best, if not the best, of the public statues in London, that of James II., was executed by Gibbons?—a fact which shows that Gibbons was really and truly an artist, and that it was but a mere accident that he was an artist chiefly in wood. Mr. Rogers's designer, who is required to design in every style, is seldom much of an artist; this kind of designing is but a modern *métier*, necessitated by the whimsiness of the day. Not one of the original artists in any of those styles could design in any way but his own.

One word more, sir, and then I must leave this subject,—at least, for the present. In my several letters of this correspondence I have endeavoured to uphold the status of the wood-carver as an artist, and I have contended against unconstitutional interference with the independent conduction of his profession. I have maintained:—

1. That wood-carving needs only a liberal demand for its exercise in order that it should flourish as of old. This your correspondents have confirmed in several ways, and by citing instances of clever men languishing for want of encouragement, and not from want of ability.

2. That if there were a great demand for it, young men who have been educated as artists would turn their attention to wood-carving. Wood offers no technical difficulty but what can easily be surmounted by the true artist.

3. That wood-carving, though not encouraged as it might be, is anything but defunct in this country.

4. That a school of wood-carving, therefore, is not required; that its establishment under existing conditions, and placing it under the direction of a foreigner, is to depreciate the status of the English wood-carver, and of English wood-carving, in the eyes of foreigners. It should not be a matter of mere *laissez-faire* to a project, which is a standing reproach to the ability existing in this country, though in other respects it may be powerless either for good or evil, for it diverts public attention from the real cause of the depression in the art of wood-carving, and raises false expectations; it is unconstitutional in procedure, and it is unpatriotic. The promoters of this and other spurious schemes, and the decriers of the British artist's and workman's abilities, must not be surprised if the world take them at their word, and if, as chief agents in this depreciation, they should destroy the repute of and ruin English manufactures. It lies with the intellect and wealth of England whether we have a great school of the leading and subordinate fine arts, for if the wealth of the country be not intelligently and liberally directed to the encouragement of the arts, all other appliances devised for this purpose will prove but vain and empty *shams*.

Meter.

Sir,—Having been engaged over three years at St. Paul's Cathedral carving the soffits and friezes in the new west lobbies, and a large quantity of work in the choir, I hope I may be allowed to pass a few remarks on the subject of wood-carving now under discussion in your journal. I think, with Mr. Wallis, that Mr. Rogers's idea that it takes three men to produce good wood-carving, viz.,—the master who buys and stores the wood, the designer, and then the workman who does the actual carving,—is simple in the extreme. The history of all great works of art teaches us that they have been the effort of one man. The brain to conceive and the hand to execute must be united in the one person before any great work can be produced. The National School of Wood-carving, in my opinion, will only tend to enlarge the fault under which our wood-carving is now suffering, that it makes us a nation of careful copyists, and capable of producing work finished to an almost painful extent; but in encouraging and fostering that power of design and facility of execution that indicate genius, it will do nothing. How, then, is this point to be infused into our wood-carving, in a similar way to which our sculpture and painting are fostered by giving the artist the opportunity of exhibiting his work to the public in some place and by some means that will insure his work being brought into notice? The only chance that exists at present is some workmen's exhibition to which the classes likely to be patrons will not come, and in which on that account the exhibitor has no faith. If he is successful, the paltry prize of, perhaps, 10s., is the only reward for months of labour undertaken after a day's work has been done. Grinling Gibbons depended upon no school of art for instruction. The power to conceive works like the reredos at St. James's Church, Piccadilly, or those beautiful works at Windsor and Chatsworth, and many others I have seen and could mention, is a natural gift; and what is wanted is that men who have the desire to excel in that line of art shall have some ready means of bringing their work into notice, and find that personal ambition and individuality fostered, without which no one has ever risen to fame or produced a great work.

One great drawback against wood-carving now is that the style of internal architecture in vogue does not allow of any great effort in that line of art. In the times in which Gibbons lived our houses were wainscoted, and the panels gave an opportunity for the carver which now does not exist. As Allan Cunningham states, all is now bald and plain, and the eye looks in vain for that bold relief and imposing effect which Gibbons alone could produce. As for the carvings of Mr. Rogers and others, beautiful and exquisite though they are, after all they are merely the trifles of the art.

I would direct your readers' attention to the address by Mr. Val. Prinsep, A.R.A., to the students of the City School of Art. He says our advanced civilisation and art-teaching have made us nothing more than clever in manipulation, but we have no sentiment. To encourage this attribute of sentiment, then, is what is wanted. A school to teach wood-cutting may do some good, but that it will bring about the end desired it is vain to hope. We want artists to think and act for themselves, and to learn that this great desire for minute manipulation is a secondary consideration. Let the wood-carver, then, be able to feel that his endeavours will command attention, and I believe there are many carvers amongst us who would enter the lists and fight the fight with spirit, and be able to show that the fact of wood-carving having gone back is not the fault of the carver, but of the system and want of opportunity under which he works.

T. Colley, Jun.

MILE END OLD TOWN COMPETITION.

"The spirit I have seen may be the devil,
And the devil hath the power to assume a pleasing shape."

Sir,—Hamlet's soliloquy forced itself upon me on learning the *dénouement* of the farce lately played by the Guardians of the Poor of Mile End Old Town in the appointment of an architect for their infirmary extension.

The public should know that the guardians, intending to extend their workhouse infirmary, sent circulars to some ten architects, inviting terms and experience. Several replied who have designed and carried out such buildings, myself among the number. A call was made on some of the members of the Guardian Board, and the asseveration that none but men who could refer to such work would be employed was made and believed in. Imagine, then, our surprise on discovering that the most experienced men were all excluded. Well, the wise men have ever come from the East; therefore is it reasonable to suppose any, except those with East-end connexions, could be selected for submission by the committee to the Board?

Ah! well, many geese are slaughtered and dressed at this season of the year. That is our consolation and answer, so our *auser* only followed suit; and as the talk of employing none but experienced men was satire only, we will call Churchill to our aid and ask him to say his say for us:—

"When satire flies abroad on falsehood's wing,
Short is her life, and impotent her sting;
But when to truth allied, the wound she gives
Sinks deep, and to remotest ages lives."

Competitor.

COLOURED STATUES.

SIR,—It has been remarked in respect to the article which appeared in the *Builder* of November 29th, "On the late John Gibson, R.A., of Rome; the Colouring of Statues, and the Venus of Cnidos," that the argument drawn from that statue is indicated as having been novel at the time I mentioned it to the late Mr. Gibson; whereas, it is to be found in the valuable Handbook of Sculpture by the late Mr. Richard Westmacott, R.A., which was published in 1864. I am not able to recollect whether the conversation I had with Mr. Gibson was prior or subsequent to a paper I read on the subject at the Society of Arts at one of its Wednesday evening meetings, namely, on April 24th, 1861, a report of which is contained in the volume of its Transactions for that year, on which occasion, for the first time in public, I introduced the illustration to be drawn from the accounts extant of the Venus of Cnidos in respect to the practice of the Greeks in the colouring or non-colouring of their marble statues. The late Mr. Westmacott was present on that occasion, and added much to the interest of the discussion which followed by taking part in it. He gave me his valuable support in many respects, and in relation to that one illustration and the mode in which I had applied it, he did me the honour of adopting them, and incorporating them in his "Handbook of Sculpture," which appeared three years afterwards, and of which he kindly sent me a copy, which I often consult, as it is a very excellent work, not only for the use of students, but for compendious reference on the subject it treats. J. BELL.

A NUT FOR CHRISTMAS.

SIR,—I have a nut that will make the fortune of whoever cracks it, a fortune so large I am afraid to estimate it, and the blessings it must confer upon us all would be such that the name of the fortunate solver of the difficulty would never be forgotten,—and here it is.

The force exerted in lifting the tides is so great that if it could be utilised all our railways, all our factories, all the work now done by steam engines, could be done by it, and there would be plenty to spare. Now, the man who can catch the force and utilise it will solve the problem, and I really believe that if a tithe of the thought had been bestowed on this point that has been spent on many other matters it would have been solved long ago.

I fancy I know a pair of crackers that may crack this nut; they are not quite complete, they want a rivet,—who will supply it? Let us know, you say, what your crackers are before we answer your question. Well, that is fair enough, so here they are.

One jaw of the cracker is Brunel's atmospheric railway of thirty or forty years ago. I rode in it when a boy; no modern locomotion is equal to it,—a gliding sensation like a skater on the ice,—no jerk, jerk, jerk, no steam, no smoke; the first carriage keyed to a piston that slides along a pipe, no fear of its leaving the rails,—a cushion of air between each train, no danger of collisions. This system was worked by compressed and exhausted air; it was in operation between Exeter and Newton, and London and Croydon, and was given up because the present was cheaper, although in other respects it was a success.

The other jaw is a compressed air-chamber, filled by the tide. I think it was in 1872, when strolling through the galleries at South Kensington, I saw an Italian,—Signor Tomassio was his name, I fancy,—but he had a small circular saw at work driven by compressed air, and his proposal was to obtain this by utilising the power of the tide. There was a receiver, like an inverted kettle, with a pipe and tap in the top, and an engine driven by air instead of steam. As the tide rose the pressure increased, until the gauge indicated the requisite figure, when a tap was turned, and away went the engine and round went the saw.

Now suppose, just to begin with, we lay down a pipe, say, from Brighton to London, with a slit in the top, and a flexible cover to open in front of the piston-rod and close after it, just as Brunel did fit in piston and rod to our first carriage, and there we are.

Now there is a lot of chalk at Brighton (burnt chalk is lime), and shingle on the Brighton beach. Lime and shingle make concrete, and this is what I would make my receiver of.

These receivers or air-chambers could be built on the beach, and strengthened by iron if necessary. The roof could be levelled and chalk thrown on top to balance the pressure within, or buildings could be erected on it.*

Floodgates next the sea, a pressure-gauge and a safety-valve for security, a pipe for the air with valve, and a connexion with the railway, makes the thing complete.

Now if there is a flaw in my argument, I should like to be shown it. I suppose no one doubts the power of tide to do the work. The Italian has shown us how to obtain compressed air from this power and to use it for driving machines, and Brunel has shown us how to use this air for the propulsion of trains.

The rivet wanted is cash to carry it out. Money, they say, is plentiful in the City. Let some of the owners use a little of it. If my reasoning is right, it will produce such returns as money never yet produced. Let some practical engineer make a working model. People like to see the wheels go round. Perhaps the sight of the thing, if neatly finished, might unlock the chest of the capitalist, and the visions of fat royalties might tempt him on, at all events. Here is my Christmas nut: who will crack it? W. H. LASCELLES.

GAS IN SITTING-ROOMS.

SIR,—It is all very well to complain of the gas, but has any practical method been suggested, at once simple and reliable, which could be provided during erection by the builders of houses of the 40*l.* to 50*l.* a year type, with rooms of from 1,500 to 2,500 cubic feet of space, for draining the tops of the rooms? It is, of course, essential that any construction be simple in execution, self-acting, and not liable to get out of order.

In a terrace house of the above type the front room contains 1,900 cubic feet, the height being 9 ft. 6 in., opening into a back room of 1,500 cubic feet, with folding doors (always open). This room has a three-light gaselier, Sugg's burners and regulators; there is an opening 9 in. by 3 in. under the ceiling into the passage near the front door, and an Arnott in the chimney-flue, which acts well. The window and door are ill-fitting, the fire draws properly, and yet the gasiness is intolerable.

The question is, How can you collect your ceiling drainage to a point? So long as the gas blends with the air of the room there will be a difficulty in removal, because no ceiling flue could be laid in of sufficient capacity to act for the whole room. Such a flue might be constructed for the gas alone, but the gasfitting manufacturer must here step in and amend the ordinarary gaselier so as to throw the gas products into this flue by some modification of Rickett's system or otherwise. Then the lighting of the gas would create the current, and all would be well. No doubt it will tax invention to design a three-light gaselier with batswing burners and flue to each concentrating at the top, which shall be at once good-looking and but little more expensive than the present which are bought by the class of people who inhabit the above type of house, but it must be done. F. N.

P.S.—When the proper gaselier is obtained the construction of the ceiling-flue must be carefully worked, as the heat from three batswing burners is very great, and the passage of the trimmer is a trouble. This is a question that ought not to be overlooked in the Building Act.

ARCHITECTS AND SUPPLY COMPANIES.

SIR,—With reference to some of the directors of the Co-operative Foundry and Builders' Supply Association lately advertised, will you allow me to ask if the regulations of the Royal Institute of British Architects allow of their Fellows and Associates becoming thus interested in builders' foundries and the supply of builders' materials? A. B.

Evening Study.—The library of the École des Beaux Arts, Paris, is to be open to the public every night from half-past seven to ten o'clock. The library is very rich in works of art and illustrations of the great galleries of Europe.

* To be occupied by "airy sprites."—*Printer's devil.*

COMPENSATION CASES.

BALLARD *v.* METROPOLITAN BOARD OF WORKS.

THE Metropolitan Board of Works requiring the premises of Mr. George Ballard, 112, High-street, Peckham, ironmonger, for the purposes of the Camberwell and Peckham improvement, served a notice to treat, and after considerable negotiation the Board made a sealed offer of 3,500*l.*, which, being declined, the case was referred to Mr. E. N. Clifton as umpire, who heard the same at the Surveyors' Institute, Great George-street. The witnesses called on were Mr. Ballard, and Messrs. Cooke, Baines, Virgoe Buckland, and L. H. Isaacs, surveyors; Mr. B. Grellier, accountant, with Messrs. Scamell & Thomas, trade valuers, for the claimant, and Messrs. Robert Reid, Samuel Walker, and Castle (Fuller, Son, & Hervey), surveyors, and Mr. Woolley, accountant, for the Board.

The umpire awarded the sum of 4,123*l.*

LONDON AND BLACKWALL RAILWAY COMPANY *v.* KATTE.

AT the Mansion House Police-court, on Monday, the London and Blackwall Railway Company, by their secretary (Mr. J. F. Kennell), took proceedings by summons against Mrs. Adelaide Katte, a widow, keeping a hairdresser's shop at 19, John-street, Crutched Friars.

By a special Act of 1876 the company are empowered to widen their line and enlarge their stations, and, with that view, they have authority to purchase premises in the line of the proposed improvement. The defendant, who had had notice that the property was required for the improvement, had failed to agree with the company as to the amount of compensation to be paid to her, and she was accordingly summoned under the 121st section of the Lands Clauses Consolidation Act, 1845, for the purpose of settling the claim.

It was admitted on both sides that all legal preliminaries had been satisfied, and the sole question for the determination of the sitting Alderman (Sir Thomas Gabriel) was the amount of compensation to be awarded. The defendant claimed 85*l.*, being three years' purchase of the profit on her business, and the cost of her fixtures and removal to other premises. She kept a barber's shop, in which her boy assisted her. It was elicited that she was only a tenant liable to four months' notice to quit.

Mr. Nicoll, for the company, admitted that they were bound to pay the defendant compensation, and suggested that a year's purchase would meet the justice of the case. If railway companies were called upon to meet there heavy claims for compensation, there would be an end to the improvements of either railways or streets.

Alderman Sir Thomas Gabriel, in the result, awarded the defendant, Mrs. Katte, 100*l.* compensation and 10*l.* costs, and ordered her to give up possession on the 1st of January next.

ARCHÆOLOGICAL NOTES.

London and Middlesex Archæological Society.—At the meeting of this Society on the 8th inst., Mr. J. E. Price exhibited and described some Roman and other antiquities found during the past few years in the City, especially those found during the excavations for the foundations of the building of the National Safe Deposit Company in Walbrook. Mr. T. Blashill exhibited an old wood-carving found in a house in Aldgate, remarking that it could not be drawn with a compass, which was a peculiarity distinguishing ancient from modern carved work. It probably belonged to some ancient religious house in the vicinity where it was discovered. Mr. Richard Mann exhibited, through Mr. Roach Smith, photographs of some interesting Roman sculptures recently found at Bath. They comprised cornices, shafts of columns, capitals, pilasters, &c., many being elaborately carved and ornamented. They were found on the site of the ancient Roman baths.

A Roman Vase. — Among a number of objects found by Mr. Geo. Payne, jun., in a Roman grave near Sittingbourne, Kent, and exhibited at the Society of Antiquaries on the 4th inst., was a remarkably fine vase in bronze, 10½ in. high, 6¼ in. broad at the widest part, 3⅜ in. at the base, 2¼ in. at the neck, and widening at the rim to 3⅞ in. The handle is of solid metal, and very massive; that portion of it which is fastened to the body of the vessel is beaten into a kind of shield, 2½ in. in width, upon which is shaped in high relief the figure of a man in a nude state standing in an attitude ready to attack. In his right hand is an uplifted sword; in the left, which is raised to the centre of the body, is the scabbard, and over the arm is thrown the cloak, the folds hanging below. On his head is a cap; his mouth is open as if in the act of shouting. Under the right hand is a decapitated ram or goat, legs uppermost, with blood flowing from the neck, the head having fallen at the man's feet. Between the man's legs reclines an ox, and outside the left leg is the head of a boar with uplifted snout. Above the

man's head the decoration is continued up the handle, which at this point contracts to about an inch; here a goat is represented galloping; over it are two animals somewhat indistinct; above them is the figure of a man seated and holding a crook in the right hand. The handle above is encircled half-way round by a band with a thin line of silver in the centre. The rim of the vase is clasped by the heads of two birds, with eyes of silver, and the long beaks are drilled with holes to represent teeth. The necks of the birds are divided by a scroll pattern, which flows down the handle to the band before mentioned. The only iron object is a lamp-stand, with bar for suspension.

The Temple Caves at Ajanta.—At the meeting of the Royal Asiatic Society on Monday evening, the President, Sir H. C. Rawlinson, K.C.B., in the chair, a paper was read, contributed by Babu Rajendralala Mitra, "On the Age of the Temple Caves at Ajanta," in which it was maintained that this question could be set at rest by the evidence of the inscriptions to be found in many of them, which showed, as he adduced, grounds for believing an antiquity as early as the first century of the Christian era. On the other hand, Mr. James Fergusson contended, in reply, that the architectural details clearly proved that the most important of them were formed as late as the middle of the seventh century.

WATER SUPPLY.

Aberystwith.—The Local Government Board have given their sanction to a scheme adopted by the Aberystwith Town Council for supplying the town with water from Plynlimmon, at an estimated cost of 16,000*l.* The Commissioners of Woods and Forests have granted, upon favourable terms, the use of the water which belongs to the Crown. Sir Pryce-Pryce has also granted the use of his land upon liberal terms. The supply is said to be inexhaustible, and of the purest quality. Mr. Stooke is engineer of the scheme.

Arbroath.—At a meeting of the committee of the Local Authority of St. Vigean's parish, held on the 9th inst., it was mentioned that the Earl of Northesk had agreed to introduce a supply of water into the fishing village of Auchmithie, near Arbroath (the Musselcrag of "The Antiquary"), and also to improve the drainage. The water to supply the village is to be lifted by means of a hydraulic ram from a spring at the base of the cliff on which the village stands. The work has been entrusted to Mr. Keith, C.E.

Opposition to the proposed Water Bill for the Metropolis.—At the half-yearly general meeting of the Southwark and Vauxhall Water Company, held on the 11th inst., the chairman, Mr. Alderman Knight, referring to the Bill proposed to be introduced next Session for the compulsory purchase of the undertakings of the Metropolitan water companies, said, if it should be proposed to acquire the Company's undertaking on the basis of the price of the stock last June, they would oppose it to the utmost, as such a calculation would inflict a gross injustice on them.

GAS JOTTINGS.

London.—It is not long ago since the Surrey Consumers' Gas Company was absorbed by the South Metropolitan Gas Company. The amalgamated companies are now to be absorbed by the Phœnix Company, with the view of concentrating all the companies supplying South London, and forming a gigantic establishment somewhat of the character of that at Beckton. It is rumoured that the companies are seeking to acquire nearly ninety acres of land in the neighbourhood of Greenwich. No doubt amalgamation will bring with it many advantages in administration, but due regard will be had, we hope, for the interests of the public.

Bristol.—Mr. B. Kitt, the gas engineer of the Bristol Urban Sanitary Authority, having perfected his system of street-lighting, the Corporation has adopted it, and it is now permanently applied to the whole length of Victoria-street, leading from the railway terminus to the centre of the city. Concave mirrors or reflectors are placed between two gas jets, used instead of a single jet of an ordinary street-lamp. Some are made of block tin, and others of glass, which requires no cleaning. Originally the mirrors were suspended from the top of the lamp, but, as it was found in these circumstances exceedingly difficult to focus the light, Mr. Kitt now has the mirrors and burners made in one fixture, which is screwed on the gas-pipe, above which there is an adjusting screw by which the mirrors can be brought to the exact focus in each particular lamp. The light thus obtained is very satisfactory, and it is claimed that the consumption of gas in the two jets is not greater than that of the single jet formerly used. The roads of Clifton are to be next lighted on the system.

COW-HOUSES IN THE METROPOLIS.

In former volumes of the *Builder* we have depicted, both with pen and pencil, the unsatisfactory manner in which cows were,—and are now in some instances,—wont to be stowed away in very circumscribed back premises, greatly to the detriment of the health of the cows and that of their keepers. We remember one case, that of a "dairy" in South London, in which two or three cows were kept in what in other shops would be called the "shop-parlour," and the full odour of the cowshed used to pass through the shop out into the street, where it was only too perceptible by the nostrils of the passer-by. It is satisfactory to see that some supervision is now being exercised over the sanitary condition of cowhouses.

We note that at the Blackheath Petty Sessions, on the 9th inst., the magistrates were engaged for two or three hours in adjudicating upon the applications for a renewal of cowhouse licences. It is usual to grant these licences at the October Sessions, but in consequence of the regulations recently made by the Metropolitan Board of Works, they were adjourned, to enable the dairymen to make the necessary alterations in their premises. The two months had expired, and it was found that very few of them had complied with the requirements of the law. About one-fourth of the cowkeepers had made a commencement, and convinced the officer of the Metropolitan Board that they really intended to do what is required, and the Bench granted their licences, but gave instructions for them to be impounded or kept back until the certificate of the Metropolitan Board was produced.

Mr. Lowe (one of the magistrates) pointed out that the licences having been granted by the justices, it became a question whether they could be prosecuted for keeping cows without a licence in the event of the work not being completed.

The Bench were of opinion that they could be proceeded against, inasmuch as they would be unable to produce a licence when before the police magistrate. With regard to the other applicants, the licences were refused altogether, and these cowkeepers, who we hear, number some hundreds, are likely to get into serious difficulties, the Bench urging Mr. Spencer, who appeared for the Metropolitan Board, to prosecute in every case of keeping cows without a licence.

Miscellanea.

Royal Institute of British Architects.—At the second ordinary meeting of the session, held on Monday evening last, their Royal Highnesses the Duke of Edinburgh, the Duke of Connaught, and Prince Leopold were elected Honorary Fellows, by acclamation, on the motion of Mr. Charles Barry. The following gentlemen were balloted for, and declared to be duly elected, viz.:—As *Fellow*,—Mr. John Bond Pearce, of Norwich. As *Associates*,—Mr. Martin Brereton Buckle, of Seaforth, Malvern; Mr. Henry Siddon Greaves, of the Public Works Department, Cape Town, Cape Colony; Mr. Charles Valentine Hunter, of Bedford-row; Mr. Arthur Harrison Newman, of Tooley-street; and Mr. William H. Ackin Berry, of Murree, Punjab, India. As *Honorary Associate*,—Lord De L'Isle and Dudley. A memorial sketch of the life of the late Frederick Pepys Cockerell was read by the secretary, Mr. W. H. White. Of the discussion which ensued we shall give a report next week.

The Lighting of Paris.—Lighting the streets of Paris costs the municipality, in round numbers, 169,600*l.* per annum. The number of jets employed is 38,400, of which 4,000 are extinguished at midnight. In the coming year it is proposed to spend 16,200*l.* in addition, by lengthening the hours during which the lights burn, and by establishing candelabra at certain crossings where the light is at present insufficient.

The Electric Light.—At the meeting of the Court of Common Council on the 1st inst., it was resolved "that it be referred to the Bridge-House Estates Committee to consider as to the practicability and advisability of lighting London Bridge by the electric light, or of otherwise improving the present defective lighting thereof, and to report thereon forthwith to this Court."——On the 2nd inst. Messrs. Newton, Chambers, & Company introduced the electric light for the purpose of illuminating their extensive works at Thorncliffe.——The completion of the first year of the illumination of the Thames Embankment by electricity upon the Jablochkoff system has been marked by a further and important development of that system, viz., the successful extension of the system to the Victoria Station of the Metropolitan District Railway, the source of power being that at Charing-cross, which supplies the Embankment and Waterloo Bridge with light. The lighting up of the station took place on Monday afternoon. The station is 350 ft. long, 50 ft. wide, and 40 ft. high. There are two platforms, each 15 ft. wide, the railway space between them being 20 ft. wide. There are ten lights, which are produced and maintained by the same steam-engine which is maintaining the forty lights on the Embankment and the ten on Waterloo Bridge. The engine is, therefore, now maintaining a total of sixty lights. Of still greater importance, perhaps, is the distance to which it is now found possible to successfully transmit the electric current for purposes of illumination. The distance marked on the map of the District Railway between their station at Charing-cross and that at Victoria is 2,383 yards, 1·354 mile. The length of wire between the two stations, however, owing to curves and losses necessarily attending the laying, connecting, and fixing, is about 1·65 mile. The whole circuit is thus equal to a length of 3·30 miles. The success of this experiment augurs well for the future of electric lighting.

Activity in the Iron Trade.—Last week the plant used by Mr. Daniel in constructing the new Portishead Docks, Somerset, was sold at auction, by Mr. Rymill, of London, when a general improvement was realised of at least 25 per cent. over the prices of two months ago. Old rails made from 85s. to 90s. per ton; the locomotives, steam cranes, portables, and other machinery bringing equally good prices.——Messrs. Bolling & Lowe, in their December report, say:—"On comparing the state of the iron and steel trades in August and November of the present year, we find an advance in prices, and a feeling of hopefulness as regards the future, which we are confident no one in the summer anticipated would so soon take place. The commencement of this reaction is unquestionably due to the demand from the United States. It was considered at first unlikely to last, but it has continued on advancing prices until buyers from other quarters have anxiously rushed in to secure their winter requirements; and a certain amount of speculation being added, the advance may now fairly be looked upon as permanent, in so far as it will surely carry us over the spring." The table they give showing the quantity and value of the principal iron and steel materials exported to the United States during August, September, and October, 1877, 1878, 1879, is very remarkable. While in 1877 we get 37,707 tons (627,421*l.*), and in 1878, 37,988 tons (537,121*l.*), in 1879, the figures are 266,829 tons (1,599,330*l.*).

The Medal given to successful exhibitors at the Paris International Exhibition of last year is a fine work of its class. The head typifying the Republic fills nearly the whole field of the obverse, and is especially beautiful. On the reverse, Fame sends off a winged messenger with a tablet on his head bearing the name of the exhibitor for whom it is intended. The name is not written with a graver, as usual on such medals, but is in raised letters, and is obviously struck with the rest of the design, which would seem to involve a change in the face of the die for each medal struck. The engraver of the medal is M. J. C. Chaplain, and he deserves praise.

Schools at Leytonstone.—The guardians of the poor of Bethnal-green at their last meeting approved the plans submitted by their architects, Messrs. A. & C. Harston, for new school buildings at Leytonstone and directed the clerk to forward the same to the Local Government Board for their sanction.

The Mersey Railway Tunnel.—It is with no small satisfaction, says the *Liverpool Daily Post*, that we are able at length to announce that the preliminary works of the Mersey Railway have been commenced, the contract for the shafts at Liverpool and Birkenhead, and for the drainage-heading under the river Mersey to connect them, having been let to Mr. S. C. Ridley, the well-known contractor for the Birkenhead Joint-Railways Extension, who will push forward the works with all possible energy. The engineers, Messrs. Brunlees & Fox, last week visited Liverpool, and, with the consent of the Mersey Docks and Harbour Board, fixed upon the sites of the shaft. This scheme must not be confounded with the Mersey subway, which is an entirely distinct undertaking. The first contract, amounting to half a million of money, relates to the distance from Grange-lane, Birkenhead, connecting the London and North-Western and Great Western systems and the dock-railways on the Cheshire side, and carrying a double line of railway under the river Mersey, terminating in Liverpool. 25,000*l.* have been subscribed for meeting the expenses of these preliminary works.

The Society of Telegraph Engineers.—At the annual general meeting of this society, held at the Institution of Civil Engineers, on the 10th inst. Mr. W. H. Preece was elected President for the ensuing year. The report of the Council stated that fifty-nine members and associates had been elected during the year, bringing the total of all classes up to 1,019. The losses by death include Sir William Fothergill Cooke, whose name is so intimately connected with the introduction of the electric telegraph, and Professor Clerk Maxwell. It was stated that the magnificent collection of electrical works bequeathed to the society by the late Sir Francis Ronalds was being classified and bound, and that the printing of the catalogue, including 12,000 titles, was nearly completed. Special allusion was made to the labours of the International Telegraph Conference held in London during the months of June and July last. The financial position of the society was reported as very satisfactory.

Bravery Rewarded.—At a meeting of the Chapter of the Order of St. John of Jerusalem in England, held last week, it was resolved to confer the medal awarded by the Order for deeds of gallantry in saving life on land on Mr. Arthur H. Stokes, one of Her Majesty's sub-inspectors of mines, Charles Maltby, John Hancock, Thomas Davis, and John Davis, in recognition of the successful exertions made by them, at great personal danger, in July last, to rescue one Dennis Bagshaw, who was imprisoned for five days by a sudden fall of "shale," or old workings, from the roof of the Black Engine Mine, Eyam, near Sheffield.

Govan.—St. Anthony's R.C. church, which was recently completed, has been opened. The old building was found insufficient for the wants of the congregation, and it was resolved to erect a larger edifice. The new church, which is built on the site of the old one, is in the Byzantine style of architecture. It is seated for 1,500 persons, and has a large sanctuary. The altar is carved in oak, and there are three roomy vestries and a baptistery. The architect is Mr. Honeyman, of Glasgow.

Mechanical Plastering of Walls.—In America a machine for plastering walls has been invented, which consists of a receptacle for the mortar, the segment of a cylinder in form. It is provided with a hinged plate that presses against the mortar, and, as the receptacle is moved upward against the wall, presses the plaster out through a narrow-gauged opening at the bottom.

Street Footpaths in Frosty Weather.—"N. W." urges, with justice, that occupiers of private houses and shops, not only in London but in the provincial towns also, should, during frosty weather, and when the pavements are very slippery and unsafe for pedestrians, have a little gravel, sand, sawdust, or a few cinders sprinkled upon that portion of them which is in front of each of their establishments.

Curator of Works of Art in the City.—The City Lands Committee, reporting on a petition of Mr. John Frederick Dicksee, have recommended to the Court of Common Council the appointment of a curator of works of art belonging to the Corporation, and that an honorarium of 100 guineas per annum be presented to the person who may be appointed to the office. The report was adopted.

Sale of the Fillebrook Estate, Leytonstone, Essex.—Messrs. Protheroe & Morris offered for sale at the Workmen's Hall, Stratford, on Monday evening, sixty-six plots of building land on the Fillebrook estate, in the Walwood, Drayton, and Bulwer roads. Mr. G. F. Morris was the auctioneer, and previously to offering the lots, he stated that sewers were laid in the roads and a new main drain had just been put down by the Leyton Local Board. The situation was described as healthy, and as being within easy distance of some of the prettiest parts of the forest. The first and several succeeding lots realised 5*l.* 5*s.* per foot frontage, and the whole of the estate was eventually sold at prices varying from 4*l.* to 5*l.* per foot. The remaining portion of the estate will be offered for sale in February next

Harbours on Low and Sandy Coasts.—The King of the Belgians, it is announced, offers a prize of 25,000 francs, or 1,250*l.*, for the best work on "Means for the Improvement of Harbours on Low and Sandy Coasts," such as those of Belgium. The competition is open to writers of all nationalities. Foreign writers must send in their essays to the Ministry of the Interior at Brussels on or before January 1st, 1881. The award will be made by a jury of seven persons, consisting of three Belgians and four foreigners of different nationalities, who will be appointed by the king. The successful work will be published by the Belgian Government in 1882.

Competition: Withington Public Buildings.—Some months ago the Withington Local Board invited six firms of architects, practising in Manchester, to send in competitive designs and detailed estimates for a Public Hall and Offices. One of the conditions was, that each of the competitors should receive an honorarium, except the one whose design was selected, who should be appointed to carry out the necessary works. Designs were accordingly submitted, and the committee, having taken the opinion of several local builders as to the accuracy of the respective estimates, recommended the Board to appoint Mr. L. Booth, of King-street, Manchester, as their architect. The recommendation was adopted.

The Council Chamber, Guildhall.—A new Council chamber has long been talked of, and will probably, in a few years' time, be provided. In the meantime, the Court of Common Council has referred it to the City Lands Committee forthwith to make arrangements for increasing the accommodation by raising the public gallery of the existing chamber, and providing more seats for members, each seat to be separated in a similar manner to those in the Aldermen's Chamber, and so arranged that the deputies and the chairmen of committees shall have special seats allotted to them, at an expense not exceeding 750*l.*

Street Hydrants.—The street hydrant system in the City of London is now complete, and the Gas and Water Committee of the Corporation at their last meeting received information that two fires, which might have been of a very serious character, took place a few days ago, and were extinguished by means of the hydrants. There are now 818 hydrants ready to be employed for the extinction of fires in the city of London. It is asserted that no other city or town in the kingdom possesses a similar system of hydrants.

A Hospital for Hounslow.—Mrs. Lydia Manning Grimes, who has resided in Hounslow for a great number of years, has left the sum of 10,000*l.* for the purpose of erecting a hospital for Hounslow and its neighbourhood. After numerous other bequests, the remainder of her wealth is left to go towards endowing the proposed hospital, the deceased directing by her will that Dr. Tyler Smith shall be appointed the medical officer thereto.

Newcastle-on-Tyne.—The committee of the Larkin Memorial met at the *Chronicle* offices on the 4th inst., Mr. Cowen, M.P., in the chair. Mr. Kirton laid before the committee several designs, which were considered. Upon the motion of Mr. George Rule, who attended on behalf of Mr. Crawshay, the design of Messrs. Oliver & Leeson, architects, was adopted, and Mr. Kirton was requested to take the matter in hand and carry it into execution.

Forts.—Messrs. Bunnett & Co., Limited, have received instructions to fit their patent iron revolving-shutters to the New Battery, Peterhead, similar to the same class of shutter they have fitted to the forts at Spithead.

Court Theatre.—The new piece at this theatre, "The Old Love and the New," is more likely to prove a success than anything the management has yet attempted; the story is interesting, without any striking disregard of probabilities, and the characterisation is marked. Moreover, it is, for the most part, very well acted, and the scenery is excellent, both as regards the interiors, which are complete without being overdone, and the ruined château by moonlight, the scene of an exciting and capitally-managed duel. Mr. Coghlan and Mr. Anson are particularly good; the former displaying a quiet power which is very effective. Miss Amy Roselle, in a part a little out of her best line, acts with much feeling and intelligence. Miss Emery, who plays the most telling part in the piece, in proportion to its length, that of a heartless little butterfly, may be praised for what she does, though much more might be done.

Over Darwen.—Mr. Wm. Stubbs, district surveyor of Pendleton, has been appointed engineer and surveyor to the Corporation of Over Darwen, at a salary of 275*l.* per annum. There were 109 applicants for the appointment.

Grosvenor Gallery.—The private view of the Winter Exhibition here is fixed for Wednesday, the 31st inst.

TENDERS

For the Londesborough-street school of the Kingston-upon-hull School Board. Messrs. Botterill & Son, architects. Quantities supplied:—

Stamp	£6,630 0 0
Brown	6,179 0 0
Leggott	6,102 10 0
Sergeant	5,985 5 0
Musgrave	5,960 0 0
Drury & Harper	5,949 15 0
Clarkson & Son	5,914 7 0
Habbershaw & Son	5,836 3 6
Wilson Bros.	5,836 0 0
Stanley	5,807 12 0
Hockney & Siggins	5,794 0 0
Southern	5,733 12 0
Jackson & Spencer	5,610 0 0
Jackson & Son	5,598 0 0
Skinner (accepted)	5,597 0 0

For a side chapel to St. Austin's Catholic Church, Wakefield, for the Rev. Geo. Lambert, S.J. Messrs. J. A. Hansom & Son, architects:—

Wrigley (accepted)	£400 0 0

For fitting up factory premises, Collingwood-street, City-road, for Messrs. J. & M. Cohen. Mr. J. T. Newman, architect:—

Page	£360 0 0
Reed & Son	313 0 0
A. Reed	308 10 6
Stimpson & Co. (accepted)	267 0 0
Heating Arrangements.	
Siebe, Gorman, & Co. (accepted)	190 0 0

For tanks, Harlow drainage, contract No. 2. Mr. Lewis Angell, engineer:—

Jesse Jackson	£527 0 0
John Jackson	483 0 0
Field (accepted)	359 0 0
Blackmore	351 0 0

For first portion of University College buildings, Bristol. Mr. Charles F. Hansom, architect. Quantities supplied:—

Baker & Sons	£4,674 0 0
Stephens & Bastow	4,598 0 0
Hatherly	4,566 0 0
Davis	4,530 0 0
Veals	4,518 0 0
Pugsley	4,500 0 0
Brock & Bruce	4,470 0 0
Cowlin & Sons	4,370 0 0
Gorvett	4,359 0 0
Forse & Ashley	4,225 0 0
Wilkins & Sons	4,150 0 0
Crocker	4,093 0 0
Wilkins & Hill	4,041 0 0
Howell & Sons	3,949 0 0
Lewis & Edbrooke	3,782 0 0

For Wesleyan Chapel, Tenby. Mr. E. W. Ladd, architect. Quantities not supplied:—

	Chapel.	Boundary walls, gates, and railing.
Jones & John	£4,000 0 0	£231 0 0
T. Thomas	3,995 0 0	175 0 0
G. Thomas	3,420 0 0	160 0 0
Davies (accepted)	2,897 0 0	143 0 0

For works at the Kent and Sussex Pure Ice Company's Stores. Mr. Arthur Loader, architect:—

Reid	£276 0 0
Barnes	260 0 0
Bruton	254 0 0

For coach-house and stabling, Wellington villa, Brighton. Mr. Arthur Loader, architect:—

Longley	£600 0 0
Reid	600 0 0
Newnham	593 0 0
Bruton	585 0 0

For two houses, New Shoreham, Sussex. Mr. Arthur Loader, architect:—

Curd	£780 0 0
Burchell (accepted)	750 0 0

For new front, &c., 23, Sillwood-road, Brighton. Mr. Arthur Loader, architect:—

Hackman (accepted)	£480 0 0

For additions, 25, Sillwood-road, Brighton. Mr. Arthur Loader, architect:—

Hackman (accepted)	£385 0 0

For strengthening floors and other works to four houses, Rupert-street, Whitechapel. Mr. Holmes, architect. Quantities supplied:—

Wittle	£913	0	0
Kerry	860	0	0
Stephenson	858	0	0
Moyle & Son	809	12	2
Gould & Brand	766	0	0
Merritt & Ashby	736	0	0

For the erection of stables for 200 horses, for the lessees of the tramways, Newcastle-upon-Tyne. Mr. Edward Shewbrooks, architect. Quantities by the architect:—

Obank & Sons	£7,043	0	0
Harbottle	4,917	13	9
Gaby	4,650	5	0
Gray & Humble	4,594	8	6
Miller	4,569	0	0
Simpson	4,554	19	11
Whichello	4,537	0	0
Kennedy & Sons	4,500	17	6
Reed & Son	4,468	4	1
Elliot	4,390	0	0
Johnson	4,288	12	4
Scott	4,196	7	0
Broombead & Keswick	4,181	1	7
Jackson	4,089	17	1
Allison	4,068	0	0
Bell	4,038	19	10
Forster	4,027	18	5
Lunn	3,952	13	0
Leighton	3,818	0	0
Miles	3,657	0	0
Pickhaver	3,746	4	0
Atkinson (accepted)	3,346	14	0

For the erection of offices, restaurant, &c., Sandhill, Newcastle-upon-Tyne, contract No. 4, for Mr. W. A. Oliver. Mr. Shewbrooks, architect. Quantities by the architect:—

Reed & Sons (accepted)	£7,231	12	6

For alterations to offices, No. 50, Finsbury-square, for Mr. Edmund W. Richardson. Mr. M. H. Pocock, architect:—

Strong	£174	10	0
Sharpe & Evered	125	0	0
Browne & Robinson	110	0	0
Capon	98	0	0
Holloway	96	0	0
Nixon	92	0	0
Goad (accepted)	85	0	0

For iron fencing, Sittingbourne Recreation-ground. Mr. W. Leonard Grant, architect:—

Littlewood (per yard)	£0	18	0
Leaver	0	16	2
McLean	0	15	6
St. Pancras Iron Company	0	14	9
Gardiner	0	13	6
Johnson Bros. & Co.	0	12	6
Chittenden, Knight, & Co.	0	12	6
Geene	0	11	11
Taylor	0	11	8½
Morton & Co.	0	11	7½
Smith & Co.	0	11	0
Hill & Smith	0	10	9
Spencelayh & Co.	0	10	6
Tett & Hussey	0	9	11½
Rowland Bros.	0	9	8½
Tewmer	0	9	6
White	0	9	6
Simpson & Wood	0	9	5
Iron Fencing Co.	0	8	11½
Hernulewicz & Co.	0	8	8
Staffordshire Fencing Co.	0	8	6
Tank and Boiler Co.	0	8	2
Deane (accepted)*	0	8	0

* Mr. E. Deane having declined to carry out the work at the price he submitted, the following fresh tenders were obtained:—

Hernulewicz & Co.	£0	9	4
Tank and Boiler Company	0	8	11
Staffordshire Bolt, Nut, and Fencing Company (accepted)	0	8	11

For the erection of house, offices, coach-house, and stabling at Walmer, Kent, for Mr. F. Ommanney. Mr. E. Fry, architect. Quantities by the architect:—

	House.			Stables.		
Bourne	£2,575	0	0	£494	0	0
Stiff	2,393	0	0	493	0	0
Wise & Cottew	2,367	16	0	467	12	0
Adcock	2,240	0	0	456	0	0
W. & T. Denne	2,073	0	0	415	0	0
G. H. Denne	2,030	0	0	444	0	0
Petts (accepted)	1,965	0	0	463	0	0

TO CORRESPONDENTS.

NOTICE.

We have reason to believe that, in the case of a few copies of our last week's issue, duplicates of one of the lithographic illustrations were given in lieu of two separate views. This will be remedied on application at the publishing office.

X. (we suggest that our correspondent should eat his partridges, though they suggest *corruption*, and hold his tongue. If he never do anything worse he will be forgiven).—H. W. R. (order through any bookseller, simply giving the publisher's name; the cost can be but a few shillings).—J. W. & Sons.—J. M.—L. A.—D.—O. S.—F. W. F. D.—C. B.—C. L. R.—J. F.—N. W.—W. L. G.—H. W. R.—X.—H. B. & R.—K—A. & C. H.—C. G.—M. & Son.—E. L.—H. & K.—W. S.—T. K.—R. S.—H. W. L.—W. J.—S. H. (next week).—G. L. (next week).—A. & C. H. (next week).—R. V. R. (next week).—T. B. next week).—H. B. & B. (next week).—H. T. (next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

SPECIAL NOTICE.

Christmas Week.—*The* Builder *for the week ending December 27th will be published on* **Wednesday, 24th** *inst., at the usual hour.*

Advertisements for insertion in that issue must therefore reach the Office before Three o'clock P.M. *on* **Tuesday, 23rd** *inst.*

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DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied direct from the Office to residents in any part of the United Kingdom at the rate of 1l. per annum, *prepaid*. Remittances payable as above.

Bath Stone of Best Quality.
RANDELL, SAUNDERS, & CO. (Limited),
Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [Advt.]

Bath Freestone in Blocks of all sizes, warranted sound, and delivered at any Port or Railway Station.—YOCKNEY & COMPANY, Sole Owners of the CORSHAM DOWN QUARRY, Corsham, Wilts, to whom all letters should be addressed. [Advt.]

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset. Agent: E. Crickmay, 4, Agar-street, London, W.C.—[Advt.]

Box Ground Stone,
For Winter Use, is the Best.
Being unaffected by frost, may safely be used fresh from the quarry.
PICTOR & SONS,
Box, Wilts. [Advt.]

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [Advt.]

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 28, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tan-rooms, and terraces. [Advt.]

Whitland Abbey Green Slates.—The peculiar green tint of these stout, durable Slates recommends them for Churches, Mansions, and Public Buildings. Present Orders booked at Reduced Prices.—Apply to Mr. J. MUSCOTT, Clynderwen, R.S.O., South Wales.—[Advt.]

J. Sessions & Sons, Docks, Gloucester, Manufacturers of ENAMELLED SLATE and MARBLE CHIMNEY-PIECES, URINALS, &c. WELSH ROOFING SLATES direct from Quarries to any Station in the Kingdom. Manufacturers of Joinery & Mouldings. [Advt.]

Damp Houses and Buildings, New and Old, DRIED, completely and permanently, in a few days, by LIGNY'S PATENT APPARATUS. By appointment to the French Government. Particulars of A. DREYFUS & CO. 39, Monkwell-st. E.C. Damp basements cured.—[Advt.]

Helliwell's Patent New System of Imperishable Glazing without Putty, suitable for Markets, Railway Stations, and all kinds of covered and Horticultural Buildings. All woodwork is covered, and no outside painting is required, old roofs reglazed. Testimonial to T. W. Helliwell:—"I cannot see what better Testimonial you can require from me than the fact that I have taken off all my glass and removed other work to replace it with yours. There is nothing yet out can touch it.—W. R. Preston, Harrold Wood."—T. W. Helliwell, Brighouse, Yorkshire, and 19, Parliament-st., London. [Advt.]

MICHELMORE & REAP,
Manufacturers of
CHARLES COLLINGE'S PATENT
COLLINGE'S PATENT HINGES,
LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every Description.
36A, BOROUGH ROAD,
Discount to Builders. Illustrated List two stamps. LONDON, S.E.

Roofing Felts.—F. Braby & Co.
INODOROUS, SARKING, SHEATHING, AND HAIR FELTS, KEPT ALWAYS IN STOCK. MANUFACTURERS OF PERFORATED ZINC, PERFORATED COPPER, AND PERFORATED IRON, IN VARIOUS DESIGNS AND GAUGES.

Wrought Iron Tanks.—F. Braby & Co.
PAINTED AND GALVANISED, OF IMPROVED MANUFACTURE.

Corrugated Iron.—F. Braby & Co.
GALVANISED AND BLACK IN ALL GAUGES KEPT IN STOCK. ZINC WORK OF ALL KINDS.

FITZROY WORKS, 356 to 369, EUSTON ROAD, LONDON.
Hatton Garden, Liverpool; Great Clyde Street, Glasgow; and at Cyprus.